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Effects of mindfulness-based health education practice on health behaviors and quality of life among hypertensive patients

A quasi-experimental research

Pantip Sangprasert, Srimuang Palangrit and Natima Tiyoa
Department of Community and Family Medicine, Faculty of Medicine, Thammasat University, Pathum Thani, Thailand, and Junya Pattaraarchachai
Chulabhorn International College of Medicine, Faculty of Medicine, Thammasat University, Pathum Thani, Thailand

Abstract

Purpose – The purpose of this paper is to examine the effect of mindfulness practice on health behaviors and quality of life (QOL) among hypertensive patients.

Design/methodology/approach – A quasi-experimental research was designed by before, after and a follow-up phase (i.e. on the 0th, 6th and 12th weeks). Two primary health care units (PCU) were selected as control and experiment groups. Samples included patients 35–59 years old who had been diagnosed with stage I hypertension. Both groups received treatment according to standard hypertension guidelines. The experimental group was added as a drill for the purpose of a mindfulness-based health education (MBHE) practice that would emphasize behavior skills (in diet, exercise and mental function) and instill a feeling of adaptation to everyday life.

Findings – The total mean score of the prevention and promotional hypertension behaviors (PPHB), QOL, perceived in mindfulness (MF) and self-efficacy (SE) in the experiment group showed a significant statistical difference when compared to the control group in the 6th week in PPHB and SE (p = 0.001), QOL and MF (p = 0.001). Similar results were found in the 12th week in PPHB, QOL, SE (p < 0.001) and MF (p = 0.023), respectively.

Research limitations/implications – However, finished implementation in experiment group, during the follow-up phase on the 12th week, ten participants in the control group were excluded (Figure 1). It may be no active intervention or as usual in the control group. Thus, the authors controlled missing data using intention-to-treat analysis comparison and the data distribution was successfully tested by a normality plot before the use of statistical data. Based on the results of this study, the following recommendations can be made: patients should practice in mindfulness in lifestyle modification continued for intensive skill practice over the long term in order to promote sustainability in behavior and in QOL.

Practical implications – Mindfulness trainer should drill and faith in the value of mindfulness corporation owner with patients learning all of the times; and for health practitioner, it should add MBHE for patients.

Social implications – Education institution should add mindfulness in educational programs all of graduates.

Originality/value – The mindfulness practice-based health education training should be in counterpart with modern medicine in order to promote sound health behaviors and an improved QOL for stage I hypertensive patients and to forestall cardiovascular and blood-pressure diseases.

Keywords Quality of life, Health behaviour, Health education, Hypertension, Mindfulness practice

Paper type Research paper

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Introduction
In recent years, mindfulness-based health practices have been used to promote mental awareness. Conscious mental activity recognizes and accepts mentally perceived experiences according to Kabat-Zinn[1]. In addition, spirituality offers a form of concentration that involves a relaxed and clear mind in conjunction with mental processes[2]. Mental activity of this sort, in turn, positively affects perceived self-efficacy (SE) in behaviors that are conducive toward the promotion of health and quality of life (QOL)[3–5]. These behaviors involve holistic physical, mental, emotional and social interactions with the individual's environment. Previous systematic review and meta-analysis research showed the positive results of mindfulness-based stress reduction and mindfulness-based cognitive therapy in the physical and mental well-being of patients suffering from chronic vascular disease[6]. However, the use of these interventions was rare in the evaluation of the health behavior outcomes in vascular disease even though the modifications they incurred had the potential to reduce complications of the disease. The Center for Disease Control[7] reported complications of hypertension as causes of mortality rates, such as cardiovascular, cerebrovascular and nephropathy-related disease.

In early 2017, we conducted literature research of PubMed, Scopus, CINAHL, Web of Science, PsycINFO and Mosby’s Nursing Consult[8]. Literature from the above-named sources reviewed principle groups of strategic mindfulness in vascular disease. The results showed that self-reflective or group work induced intention, attention and attitude encouraged awareness, acceptance and self-regulation toward an individual’s perception of body and mind symptoms. This broadened thinking added a new experience derived from deep listening in group procession opportunities. Specifically, it provided a means for the promotion and perceived ability of a positive and clear mind to observe cognitive memory as well as emotion. In addition, stress reduction and compassion increased SE of behavioral promotion and QOL[2, 3].

Previously, although patients received health education from health care centers and other information about behavior modification methods, health behavior-related education did not succeed in increasing awareness and did not help to alleviate mortality rates from the complications of hypertension. Indeed, this points to a specific research knowledge gap that necessitates a solution. Previous studies researched the benefits of mindfulness in health education as well as the health promotion of adult and community health education tools, trends and methodologies[9]. The positive effects perceived in SE in health promotion behaviors showed that the concept of Pender’s model[3] in the social learning theory could be integrated to be conducive toward health education in mindfulness[3–5]. Hence, these studies can be defined as awareness acceptance and self-regulation of one’s intention, attention and attitude toward flexibility and self-management of behaviors by focusing on new direct experiences.

The purpose of the current study was to examine the effectiveness of mindfulness-based health education (MBHE) on stage I hypertensive patients. The primary outcome was the effect of prevention and promotional hypertension behaviors (PPHB), while the secondary outcome was related to the QOL and perception of mindfulness and SE. Thus, we hypothesized that after implementing an MBHE program, behavioral changes could be promoted amongst patients that would, in turn, lead to an improvement in their QOL.

Materials
Study design and research settings
A quasi-experimental design was used, incorporating a three-time measurement specifically planned for this study. The study area was from two primary care units (PCUs) located in two districts of Pathum Thani province, Thailand. A period of 12 weeks was set as the duration of this study (July 2017 to September 2017).
All participants were initially screened from each PCU by computerized recruitment methods based on inclusion criteria and a matched group of demographic data allocation. All 52 participants complied with the following inclusion criteria: that they had to be between the ages of 35 and 59 years; had to be diagnosed with stage I hypertension[10] and on an antihypertensive drug; had no underlying complications of hypertension[11]; and had an understanding of the Thai language. Participants who had a limited learning process, organic brain syndrome or a history of psychiatric problems were excluded from this study in order to control the confounding effects of the mindfulness learning process[12, 13].

The sample size was predetermined based on power analysis using G*Power[14] statistics with the effect size set at 0.4, statistical power at 0.80 and p-value at 0.05 obtaining a sample of at least 23 participants per group. Approximately, 10 percent of participants were added in case of dropouts in order to obtain the final sample of 26 participants per group as shown in Figure 1.

Outcome measures
The demographic data questionnaires of hypertensive patients were categorized according to sex, age, duration of hypertension history and educational level[10, 11]. Similarly, the basic physical information was assessed in terms of blood pressure (BP), heart rate (HR) and body mass index (BMI), and was completed by a registered nurse practitioner who was qualified and trained in accordance with international guidelines[10].

The outcome measures consisted of questionnaires; the primary included 14 items of PPHB[3, 15] and the secondary were 26 items of QOL (QOL: WHOQOL BREF THAI)[5, 11] items on mindfulness[16], and 12 items on SE[3, 15]. All of them were evaluated in five frequency rating scales: 1 score (never or few), 2 score (sometimes), 3 score (usually), 4 score (often) and 5 scores (always), respectively, in assessing PPHB behaviors and feelings of perceived QOL, mindfulness and SE. They were all continuously rated for compliance in statistical analysis.

The steps to test the validity of the questionnaires were approved by five experts: a mindfulness trainer, a psychologist, two persons to assess the prevention and promotion behavior of hypertension, and a biostatistician, respectively. Then, the Cronbach’s α was used to test 51 comparable representative samples. The result showed PPHB (α = 0.833), QOL (α = 0.910), mindfulness (α = 0.710) and SE (α = 0.843), respectively.

![Figure 1. Sample flow through the study and intervention process](image)
Data collection

The mindfulness training program

The protocol and informed consent were approved by the Research Ethics Committee of Thammasat University, MTU-EC-ES-2:218/59, with the approval date of January 18, 2017. All patients were presented with the research objectives and submitted their written informed consent before any study-related procedure was undertaken.

Instructor training: mindfulness training was obtained at Mahidol and Thammasat Universities for 10 days and at the Willpower Institute for 6 months. Meanwhile, a systematic review of principal strategies in mindfulness was summarized[8, 17]. The 12 MBHE skills-practice activities were trialed 15 times for retesting of reproducibility in comparable representative samples and were completed by following the advice of experts.

The instructor produced an intervention which comprised the principle of observing MBHE for the duration of 2 h per session that involved weekly group-meeting conversations. They were put into equal groups separated by morning and afternoon sessions. Six-week coherence practitioners observed and recognized feelings that had been adapted to everyday life as well as daily individual practice at home. They proceeded by making recordings throughout the follow-up phase on the 12th week.

Participants in the control group received health education and hypertension guidelines treatment[10] and were evaluated for questionnaire assessment on the 0th, 6th and 12th weeks. They received training after completion of the experiment group training (12th week).

Participants in the experiment group received health education and hypertension guidelines treatment[10]. In addition, the 12 activities skills practice in the six-week program were implemented by the addition of group conversation to create intention, attention and attitudes through careful listening, non-judgmentally accepting and respecting relationships. They were then evaluated by questionnaire assessment on the 0th, 6th and 12th weeks. The MBHE practice program on intensive skills after six weeks of practising is shown in Table I.

Statistical analysis

We used SPSS version 22 for Windows to perform the \( \chi^2 \)-test at the baseline of demographic data. The matched demographic and baseline interested variances data were tested by a \( \chi^2 \)-test and an independent sample \( t \)-test. We then tested the difference score at the before (0th week), after (6th week) and follow-up (12th week) phases via the generalized linear model for repeated measurements in order to estimate effects. Then, by comparing and adjusting the means score, a standard error of 95% CI was found between the groups.

Results

Characteristics of the participants

The basic physical characteristics mean ± SD in the control and experimental groups is as follows: SBP 131.8 ± 12.5 and 129.3 ± 16.0 mmHg, DBP 83.7 ± 7.6 and 75.9 ± 10.2 mmHg, HR 81.7 ± 9.1 and 88.2 ± 12.7 beats/min and BMI 28.8 ± 5.7 and 26.9 ± 2.8 kg/m². The demographic data showed no statistical significance between the experiment and control groups (Table II). The baseline in the total means score of the questionnaires showed no statistically significant differences (Table III).

Changes in PPHB, QOL, perception in mindfulness and self-efficacy

Post-intervention on the sixth week revealed that the experimental group had a statistically significantly higher aspect of means score than the control group in PPHB 13.3, \( p = 0.001 \), QOL 12.7, \( p = 0.001 \), while the mindfulness and SE perception was at 4.7, \( p = 0.001 \) and 13.0, \( p < 0.001 \), respectively. During the 12th week, during the follow-up phase,
the experimental group had a statistically significant higher total aspect of means score than the control group in PPHB at 13.2, \( p < 0.001 \), QOL at 11.2, \( p < 0.001 \), and mindfulness and SE at 2.9, \( p = 0.023 \) and 13.7, \( p < 0.001 \), respectively. (Table IV and Figure 2).

**Discussion**

First, the demographic data and prior questionnaires score data showed no statistically significant differences between the experiment and control groups and also suggested that the confounding factors were limited regarding mindfulness learning. Post-intervention and follow up at the 6th and 12th weeks in the experiment group showed that most of the aspects of PPHB and means scores in the experimental group were higher than in the control group. This difference can be explained by the MBHE integrated interpersonal group procession, which induced SE perceivability and mindfulness empowerment from the exercise phase that had been designed by Pender in 2011[3]. The relevant comparison of old and new experiences was defined in terms of their direct and indirect effects on awareness, acceptance and self-regulation in practising positive inner power through health

| Table I. The MBHE practice program on intensive skill activities in six weeks |
|-----------------------------|-----------------------------|-----------------------------|
| **Week**                   | **Skill activities**        |                              |
| 1st                        | i. Breath of life exercise to raise awareness of the learning style of breathing and relaxation from breathing[18, 19] |                              |
|                            | ii. Knowing yourself and others – sit-in-others’-mind exercise to create mindfulness by group process, building intention, attention, and attitudes through careful listening, non-judgmentally acceptance and respecting relationships |                              |
| 2nd                        | iii. Food-loving exercise to raise self-awareness, acceptance and self-regulation by testing, perceptions, low-sodium use; buying, adding seasonings, cooking low fat and calorie controlled dishes through the DASH diet and slow mastication[20, 21] |                              |
| 3rd                        | iv–v. Body movement (or exercise), eight muscle relaxation groups and bodily strength exercise to create awareness and acceptance of observed physical symptoms[18, 19] |                              |
| 4th                        | vi–viii. Physical and mental symptoms in words, magic box, wave of thought and feeling exercises to create awareness, consciousness and acceptance of the natural order (as well as physical and mental symptoms. In general) |                              |
| 5th                        | ix–x. Spider-web wonders, and bottle-of-water exercises to build awareness and acceptance of mindfulness, and to foster observation of mental and physical symptoms. Quality of observation on the part of the observer and physical/mental phenomena as observed in daily life, similar to the metaphors “outside the cars” and Teflon-pan coating |                              |
| 6th                        | xi–xii. Living robots alive and mental-bells exercises to raise consciousness, awareness, acceptance and self-regulation for observing the state of mind and behaviors in daily life |                              |

Table II. The demographic data of samples at baseline

<table>
<thead>
<tr>
<th>Table II. The demographic data of samples at baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td><strong>Age (yrs)</strong></td>
</tr>
<tr>
<td>Mean ± SD</td>
</tr>
<tr>
<td><strong>Educational level</strong></td>
</tr>
<tr>
<td>Primary level</td>
</tr>
<tr>
<td>Secondary and over level</td>
</tr>
<tr>
<td>Duration of hypertension history (yrs)</td>
</tr>
<tr>
<td>Note: ( p )-value from ( \chi^2 )-test for two groups and independent ( t )-test for age and duration of hypertension</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Experimental</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>6 (23.1)</td>
<td>5 (19.2)</td>
<td>0.734</td>
</tr>
<tr>
<td>Female</td>
<td>20 (76.9)</td>
<td>21 (80.8)</td>
<td></td>
</tr>
<tr>
<td>Age (yrs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>52.5 ± 5.2</td>
<td>54.2 ± 4.8</td>
<td>0.239</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary level</td>
<td>17 (65.4)</td>
<td>12 (46.2)</td>
<td>0.163</td>
</tr>
<tr>
<td>Secondary and over level</td>
<td>9 (34.6)</td>
<td>14 (53.8)</td>
<td></td>
</tr>
<tr>
<td>Duration of hypertension history (yrs)</td>
<td>7.2 ± 4.9</td>
<td>5.9 ± 4.0</td>
<td>0.346</td>
</tr>
</tbody>
</table>
The mindfulness practice stimulated inspirational experiences through ocular (78 percent), aural (10 percent), nasal (5 percent), corporeal (5 percent), oral (2 percent) and sensory learning[12, 13]. Moreover, three domains in learning were developed in the cognitive, affective and psychomotor domains. In addition, the qualitative data from the focus group discussion were seen through a reduction of sodium and fat in cooking, reduction of flatulence through slow chewing due to mindful eating and reduction of exercise fatigue through mindful breathing. These data were also realized as a restoration of consciousness for problem solving in daily life through mental mindfulness. According to previous studies, it was demonstrated that the mindfulness practising group had mean scores that were higher than the control group in lifestyle and problem-focused coping strategies[22].

Second, the SE in PPHB perception directly motivated the expected behavioral promotion outcomes derived from knowledge and skills that had been gained through enactive mastery and vicarious experience perceptions[3, 4]. Skills involved included buying, reasoning and preparing food as well as slow mastication. Moreover, participants felt good from the positive effects of their daily exercise. By means of their self-reflection and open-minded group-procession, participants recognized their individual progression. Their performance regarding concentrated of intention, attention and attitude was increased due to self-management in a way that showed both cognitive and behavioral flexibility, while for others it revealed compassion[2, 23]. The mental relaxation in the SE mental activity of the mindful-breathing group process was positive in mind and body; a consistency of this result increased the mindfulness perception in terms of awareness, acceptance and self-regulation. Other studies have similarly demonstrated that practising mindful breathing meditation with other exercises can improve health promotional behavior in patients with hypertension and prehypertension[19, 24]. This result found that SE in PPHB during the exercise phase of the sixth week was not significant (\( p < 0.489 \)), suggesting that this study may be addressing its focus on meditated movement rather than on the physical exercise. In addition, the goal of exercise in setting weight control brought the control body-weight lead to an increased level of perception at the 12th week (\( p = 0.001 \)). This study showed that the

<table>
<thead>
<tr>
<th>Interest variable</th>
<th>Aspect</th>
<th>Total score</th>
<th>Control means ± SD (n = 26)</th>
<th>Experimental means ± SD (n = 26)</th>
<th>( p )-value (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPHB</td>
<td>Total</td>
<td>70</td>
<td>41.1 ± 6.7</td>
<td>44.3 ± 5.9</td>
<td>0.074</td>
</tr>
<tr>
<td></td>
<td>Food</td>
<td>30</td>
<td>18.3 ± 3.6</td>
<td>19.4 ± 4.0</td>
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<tr>
<td></td>
<td>Exercise</td>
<td>20</td>
<td>11.2 ± 3.7</td>
<td>11.7 ± 2.2</td>
<td>0.533</td>
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<td></td>
<td>Mental</td>
<td>20</td>
<td>11.6 ± 2.4</td>
<td>13.4 ± 2.5</td>
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</tr>
<tr>
<td>QOL</td>
<td>Total (item 1–26)</td>
<td>130</td>
<td>92.0 ± 10.9</td>
<td>94.7 ± 12.1</td>
<td>0.397</td>
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<tr>
<td></td>
<td>Physical</td>
<td>35</td>
<td>24.2 ± 2.9</td>
<td>25.7 ± 3.7</td>
<td>0.112</td>
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<tr>
<td></td>
<td>Mental</td>
<td>30</td>
<td>23.1 ± 3.4</td>
<td>22.7 ± 3.1</td>
<td>0.675</td>
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<tr>
<td></td>
<td>Social relationship</td>
<td>15</td>
<td>10.2 ± 2.0</td>
<td>10.6 ± 2.0</td>
<td>0.504</td>
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<tr>
<td></td>
<td>Environmental</td>
<td>40</td>
<td>27.7 ± 3.7</td>
<td>28.8 ± 4.7</td>
<td>0.397</td>
</tr>
<tr>
<td>MF</td>
<td>Total</td>
<td>55</td>
<td>34.1 ± 3.9</td>
<td>33.8 ± 4.8</td>
<td>0.826</td>
</tr>
<tr>
<td></td>
<td>Awareness</td>
<td>25</td>
<td>15.3 ± 3.4</td>
<td>15.4 ± 3.5</td>
<td>0.999</td>
</tr>
<tr>
<td></td>
<td>Acceptance</td>
<td>15</td>
<td>8.5 ± 2.9</td>
<td>7.6 ± 2.8</td>
<td>0.275</td>
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<tr>
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<td>Self-regulation</td>
<td>15</td>
<td>10.3 ± 3.0</td>
<td>10.6 ± 2.6</td>
<td>0.660</td>
</tr>
<tr>
<td>SE</td>
<td>Total</td>
<td>60</td>
<td>35.5 ± 5.7</td>
<td>38.3 ± 5.4</td>
<td>0.073</td>
</tr>
<tr>
<td></td>
<td>Food</td>
<td>25</td>
<td>15.4 ± 3.7</td>
<td>16.6 ± 3.4</td>
<td>0.235</td>
</tr>
<tr>
<td></td>
<td>Exercise</td>
<td>20</td>
<td>11.0 ± 4.0</td>
<td>12.7 ± 3.4</td>
<td>0.107</td>
</tr>
<tr>
<td></td>
<td>Mental</td>
<td>15</td>
<td>9.1 ± 1.6</td>
<td>9.4 ± 2.6</td>
<td>0.576</td>
</tr>
</tbody>
</table>

Notes: PPHB, prevention and promotion hypertension behaviors; QOL, quality of life; MF, mindfulness perceived; SE, self-efficacy perceived. \( p \)-value from independent simple \( t \)-test for two groups

Table III. Means and standard deviation of the score between the control and experimental groups before the intervention
<table>
<thead>
<tr>
<th>Interest variable</th>
<th>Aspect</th>
<th>Post-intervention control: experimental adj. means ± SE (n = 26)</th>
<th>Mean diff. (95% CI)</th>
<th>p-value</th>
<th>Follow-up control: experimental adj. means ± SE (n = 26)</th>
<th>Mean diff. (95% CI)</th>
<th>p-value (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPHB</td>
<td>Total</td>
<td>39.2 ± 1.5</td>
<td>-13.3 (-17.53, -9.07)</td>
<td>&lt; 0.001</td>
<td>40.0 ± 1.5</td>
<td>-13.2 (-17.52, -8.93)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td></td>
<td>Food</td>
<td>235 ± 1.5</td>
<td>-6.5 (-8.88, -4.13)</td>
<td>&lt; 0.001</td>
<td>214 ± 0.7</td>
<td>-6.7 (-8.69, -4.80)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td></td>
<td>Exercise</td>
<td>145 ± 0.6</td>
<td>-3.7 (-5.52, -2.09)</td>
<td>&lt; 0.001</td>
<td>146 ± 0.6</td>
<td>-3.7 (-5.53, -1.92)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td></td>
<td>Mental</td>
<td>147 ± 0.5</td>
<td>-3.3 (-4.84, -1.81)</td>
<td>&lt; 0.001</td>
<td>148 ± 0.5</td>
<td>-3.0 (-4.46, -1.61)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>QOL</td>
<td>Total</td>
<td>869 ± 2.4</td>
<td>-12.7 (-19.58, -5.79)</td>
<td>0.001</td>
<td>885 ± 2.0</td>
<td>-11.2 (-16.93, -5.45)</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Physical</td>
<td>261 ± 0.6</td>
<td>-2.1 (-3.83, -0.24)</td>
<td>0.027</td>
<td>264 ± 0.6</td>
<td>-1.7 (-3.40, -0.01)</td>
<td>0.052</td>
</tr>
<tr>
<td></td>
<td>Mental</td>
<td>236 ± 0.7</td>
<td>-2.1 (-4.11, 0.04)</td>
<td>0.046</td>
<td>243 ± 0.6</td>
<td>-2.7 (-4.61, -0.92)</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>Social relationship</td>
<td>11.3 ± 0.4</td>
<td>-1.2 (-2.21, 0.08)</td>
<td>0.034</td>
<td>10.6 ± 0.3</td>
<td>0.7 (-1.65, 0.11)</td>
<td>0.087</td>
</tr>
<tr>
<td>MF</td>
<td>Total</td>
<td>338 ± 0.9</td>
<td>-4.7 (-7.38, -2.00)</td>
<td>&lt; 0.001</td>
<td>338 ± 0.8</td>
<td>-2.9 (-5.28, -0.40)</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>Awareness</td>
<td>181 ± 0.8</td>
<td>-3.9 (-6.17, -1.67)</td>
<td>0.001</td>
<td>178 ± 0.7</td>
<td>-2.2 (-4.24, -0.21)</td>
<td>0.031</td>
</tr>
<tr>
<td></td>
<td>Acceptance</td>
<td>81 ± 0.6</td>
<td>1.7 (0.06, 3.39)</td>
<td>0.042</td>
<td>7.1 (0.38, 13.9)</td>
<td>1.6 (0.19, 2.96)</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td>Self-regulation</td>
<td>115 ± 0.5</td>
<td>-2.2 (-3.81, -0.65)</td>
<td>0.017</td>
<td>112 ± 0.5</td>
<td>-1.9 (-3.38, -0.46)</td>
<td>0.011</td>
</tr>
<tr>
<td>SE</td>
<td>Total</td>
<td>466 ± 1.6</td>
<td>-13.0 (-17.49, -8.42)</td>
<td>&lt; 0.001</td>
<td>466 ± 1.4</td>
<td>-13.7 (-17.61, -9.61)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td></td>
<td>Food</td>
<td>203 ± 0.8</td>
<td>-6.4 (-8.64, -4.20)</td>
<td>&lt; 0.001</td>
<td>199 ± 0.7</td>
<td>-6.2 (-8.32, -4.12)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td></td>
<td>Exercise</td>
<td>124 ± 0.5</td>
<td>-5.0 (-9.49, 1.94)</td>
<td>0.489</td>
<td>116 ± 0.6</td>
<td>-3.0 (-4.59, -1.32)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td></td>
<td>Mental</td>
<td>120 ± 0.5</td>
<td>-3.2 (-4.64, -1.74)</td>
<td>&lt; 0.001</td>
<td>120 ± 0.5</td>
<td>-3.5 (-4.94, -2.21)</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Notes: PPHB, prevention and promotion hypertension behaviors; QOL, quality of life; MF, mindfulness perceived; SE, self-efficacy perceived. Estimated mean adjusted from GLM for repeated measure. *p < 0.05; **p < 0.01; ***p < 0.001.
principal of MBHE training with a natural body and mind symptoms approach had been created by individual intention, attention and attitude. The concept of self-reflection in a group conversation about mind and body symptoms also helped. This experience of everyday occurrences being incorporated into the program was positively experienced by the participants themselves[1, 2, 6].

Third, most of the total means score QOL at the sixth week increased statistically and significantly. However, for the physical and social relationships at the 12th week, the QOL aspect may have a gap of prolonged intervention apart from the interpersonal group, and only with supervision at the 9th week. These findings are contradictory to mindfulness training, which requires continuous experience[2, 12]. Although the previous mindfulness training studies showed an improvement in psychological QOL and physiological QOL, there were no statistically significant differences in the physical aspects between the experiment and control groups[25]. The qualitative data from the focus group discussion were seen through reports of better sleep and no headache in most participants. In the holistic dimension of health as defined by the World Health Organization[5], the QOL focusing on daily life potential was as expected and was satisfied by economic conditions, society and the environment. The result of this study was consistent with other studies that showed that QOL improved with better sleep[26] and reduced headaches[27]. Furthermore, another effect of mindfulness study demonstrated that it improved the QOL for patients who were attending an out-patient clinic[28].

At the end of this study, on the 12th week, two participants discontinued their antihypertensive medication, and two participants received reduced doses of the
antihypertensive drug as administered by their physicians. Previous studies demonstrated that the benefits from the research not only illustrated the value of mindfulness training, but also similar studies promoted health, and reduced chronic physical and mental illness among adults over 30 years of age[29]. Moreover, the results included a means of controlling biological issues such as acute or chronic pain and high BP, conditions which responded successfully to non-pharmacological holistic treatment[29].

Finally, this study has several positive features. First, it initiated the match groups of demographic data and the means score that would be used to control the confounding factors at the baseline. However, after implementation in the experiment group, during the follow-up phase on the 12th week, ten participants in the control group were excluded (Figure 1). However, there was no active intervention in the control group. Thus, in the Table IV we controlled missing data using intention-to-treat analysis comparison and the data distribution was successfully tested by a normality plot before the use of statistical data. The adjusted means score, standard error and 95% CI were compared between the groups. Moreover, this MBHE implementation integrated teach-back demonstrations that may result in better modifications than by more traditional methods[9, 17]. Participants who received MBHE experienced an increase in their awareness, acceptance and self-regulation, and ultimately achieved values and resilience in suffering from mental pain that was shown through compassion[2, 23]. Similar studies showed improvements in their mental and bodily well-being as they reached their goals of health promotion and QOL[30].

Implications
Based on the results of this study, the following recommendations can be made: first, patients should practice mindfulness and modifications in lifestyle practices that should be continued for intensive skills practice over a longer period in order to promote sustainability in behavior and in QOL. Second, mindfulness trainers should encourage the value of incorporating mindfulness practice at all times and through cooperation with their patients. Third, health practitioners should add MBHE as part of a patient’s routine for recovery. Fourth, educational institutions should incorporate mindfulness into the educational programs of all students.

Conclusions
The MBHE should be applied as a complementary treatment in stage I hypertension amongst patients in groups to produce awareness, acceptance and self-regulation for self-management in cognitive and also to control behavior promotion. These actions would have a positive effect on patients suffering from hypertension and at risk of developing cardiovascular problems.

Acknowledgments
The authors would like to express their sincere appreciation to all residents and staff of the Primary Care Units involved in this research. The authors acknowledge the kind assistance of Associate Professor Dr Chatchawan Silpakit and Assistant Professor Lampu Kosulwit, MD, Professor Peera Burankitjaroen, MD, Associate Professor Sutreera Phatrayuthawan PhD and Assistant Professor Somkiat Sangwatanaroj, MD for validating the instrument. The authors would also like to thank participants at the primary care units. This study was sponsored by a grant from Thammasat University and National Science and Technology Development Agency, NSTDA Thailand.

Conflict of interest: the authors declare no conflict of interest with respect to this study.
References


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Barriers on access to and use of adolescent health services in Ghana

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Department of Public Administration and Health Services Management, Business School, University of Ghana, Accra, Ghana

Abstract
Purpose – The purpose of this paper is to explore perceived barriers to accessing and using adolescent health services in Ghana.
Design/methodology/approach – The study was a qualitative study adopting a case study design. In total, 24 adolescents were recruited from four adolescent health facilities in Tema, a suburb of Ghana, using convenient sampling. In-depth interviews with respondents were conducted coupled with the taking of field notes and personal observations. Data collection took place between January and May 2017. Data were transcribed, managed and coded for themes. Thematic analysis was guided by Braun and Clarke’s (2006) Framework.
Findings – The findings of this study revealed that majority of the respondents were females (54 percent) older adolescents (above 15 years (60 percent), students (79 percent)), had junior high school education and stayed with their biological parent(s) (70 percent). Adolescents in this study perceived four main barriers that restrict their access to or use of adolescent health services. The barriers were found at the facility level, provider level, community level and personal level.
Originality/value – The findings of this study provide evidence-based information for planning adolescent health care interventions that would improve adolescents’ access to and use of health services in Ghana.
Keywords Barriers, Adolescent, Adolescent health services, Ghana

Introduction
Adolescents (10–19 years) are the future leaders of our society and an untapped human resource. About one-fifth (more than 1.2bn) of the global population are adolescents, and many of the world’s adolescents live in developing nations[1, 2]. Adolescents are perceived to be healthy, however, they are vulnerable and exposed to many health risks leading to premature death[2–5]. In 2015, about 1.3m adolescents died globally from causes that could have been prevented[2]. Over two-thirds of these deaths occurred in low- and middle-income countries (LMICs) with 45 percent from Africa[6]. According to Neal et al[7], approximately 16m girls aged 15–19 years and 2.5m girls under 16 years give birth each year in developing regions. About 3m girls aged 15–19 years undergo unsafe abortions every year[8]. Moreover, about 2m adolescents are living with human immune virus (HIV) globally[9], and over 41 percent of new HIV infections in every year occur among adolescents[2].
Adolescents’ health, well-being and development can be promoted through access to adolescent health services[2]. However, many adolescents do not seek health care when they should[10–12]. Prior studies show that adolescents across the globe encounter barriers such as difficulty making an appointment, long waiting hours, negative provider attitudes, lack of privacy and confidentiality, social-cultural norms and taboos, the high cost of care and stigma among issues when accessing health services[2, 12–16]. In this regard, global health organisations such as the World Health Organization have urged member countries to adopt measures for making health care services accessible to adolescents[2].

In their quest to improve access to and use of adolescent health services, Ghana Health Services in collaboration with the Ministry of Health Ghana integrated adolescent health services into primary health care. Old adolescent health facilities also known as adolescent clinics (AC) were renovated coupled with the contraction of new ones, summing up to 212 ACs. Resources such as health information materials (books, flyers and leaflets), logistics and health care providers were distributed to the various ACs[17].

Despite these efforts, both the grey literature and anecdotal evidence show that unplanned pregnancies leading to school drop-out, childbirth complications and illegal abortions remains high among adolescents in Ghana. Moreover, substance abuse and HIV infection among adolescents remain as public health problems in Ghana[17–19]. For example, the study location (Tema Metropolis) recorded 641 and 609 adolescent pregnancies in 2015 and 2016, respectively. In 2016, 21 pregnant adolescents were tested HIV positive, while 63 unsafe or illegal abortions were reported[18].

In addition, a report of the Family Health Division of Ghana Health Service indicated that adolescents’ access to appropriate health information has not improved significantly over time. Even though there has been an overall improvement in the utilisation of health care services, utilisation by adolescents remains low[17]. The report attributed these setbacks to barriers like poor provider attitudes, inadequate and poorly resourced adolescent health facilities, financial constraints and lack of parental support[17].

However, these claims have not been subjected to any scientific scrutiny. To the best of the authors’ knowledge, no empirical study, neither qualitative nor quantitative, has been conducted in Ghana to shed light on these claims. Prior studies focused on adolescents’ use and preference for sexual and reproductive health services[20, 21], with no focus on barriers to accessing and using adolescent health services. However, having empirical evidence on barriers to accessing health care, especially from an adolescents’ perspective, can inform adolescent health policies or interventions. Therefore, this study sought to explore perceived barriers to accessibility and utilisation of adolescent health services in Tema, a suburb of Ghana’s capital city.

Materials and methods

Study area

The study was conducted in Tema Metropolis, an urban area located in the eastern part of Accra, Ghana’s capital. It is the second largest populated district in the region after Accra Metropolis[22]. According to the 2010 Population and Housing Census, the metropolis has a population of 292,773 representing 7.3 percent of the region’s total population[22]. Adolescents represent about 18.9 percent of the total population of the area[22]. At the time this study was conducted, the metropolis had only four AC located within public health facilities. Furthermore, the Tema Metropolis records high incidence of adolescent pregnancies, illegal abortions and HIV infections every year[18].

Design, sampling and data collection

The study was a qualitative study adopting a case study design. Respondents were selected from four ACs. In-depth interviews were conducted using an interview guide
and a face-to-face approach at the ACs. Items on the interview guide were selected based on a review of the empirical literature with input from a senior researcher. The interview guide was tested in a pilot study comprising of ten adolescents and modified. The interview guide was made up of two main sections. The first section contained questions related to socio-demographic variables of the respondents. The second section asked questions related to perceived barriers to access and use of health services in the ACs. Inductive probing was adopted to solicit in-depth information that was not captured in the interview guide. Interviews were conducted by the second author, a trained graduate student. Notes were taken during the interview and respondents who were agreeable, were audio taped. The interviews ended when the researcher realized that respondents were not providing any new information. In all, 24 adolescent respondents were interviewed in four AC (Table I). Interviews were conducted using both English and Twi, a widely spoken local language in Ghana. Data collection was conducted between January and May 2017. Even though data collection lasted for five months, the quality of the data was not affected.

**Ethical consideration**

This study is an excerpt of a student thesis. During the time of the study, the institution was lenient with students regarding Ethical Review Board approval. However, ethical principles in research such as informed consent, voluntary participation, privacy and confidentiality among others were duly observed by first asking respondents to sign a consent form. Participation was purely voluntary and no participant was coerced or lured into participating. Respondents were assured of their confidentiality and data were destroyed after the final analysis. Also, respondents had the free will to opt-out at any stage of the interview. In addition, permission to conduct this study was granted by the Ghana Health Service, the mother institution of health care delivery in Ghana and the Metropolitan Health Directorate facility managers. Where possible, consent of parents or guardians was gained since respondents were adolescents.

**Data analysis**

Data were analysed using a thematic analysis approach. According to Maguire and Delahunt[23], this is the process of identifying patterns or themes within qualitative data. In this regard, Braun and Clarke’s thematic analysis framework was adopted[24]. Audio recording in the local (Twi) language was translated into English by the first author (Emmanuel Anongeba Anaba). The second author (Aaron Asibi Abuosi) verified the transcripts by simultaneously comparing it with the audio. The transcripts and the field notes were read over severally by the authors to gain familiarisation with the data coupled with writing down initial impressions. Adopting an inductive approach, segments of each transcript was coded to identify key concepts. Coding was done manually and independently by the two authors. Afterwards, each code was compared, discussed and modified where necessary. The codes were critically examined and those that fitted were put into themes. The themes were then reviewed to ensure coherence between each theme and

<table>
<thead>
<tr>
<th>Number of adolescents recruited</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>24</td>
</tr>
</tbody>
</table>

**Table I.** Number of respondents recruited each month, January–May 2017

**Source:** Field Survey (2017)
the data associated. Finally, the themes were defined into main and sub-themes. Results were presented based on the main and sub-themes and verbatim quotations, as seen in the findings section of the paper, were chosen at random.

Results

Socio-demographic information

The researchers selected both males and females to ensure that views of both genders were well represented. The majority of the respondents were older adolescents (above 15 years), students were mostly educated to junior high school level and stayed with their biological parents (Table II).

This section presents findings on barriers to using and accessing adolescent health services. Findings are presented based on the four main themes that emerged. These include barriers at the facility level, personal level, provider level and community level (Table III).

Facility-level barriers. Inadequate physical space and privacy. Adolescents in this study identified inadequate physical space and privacy as a facility-level barrier to using adolescent health services. Adolescents further indicated that the ACs were not spacious enough. To confirm this, the researcher observed that during a health talk session, some adolescents had to stand outside the room (AC) because of lack of space. Moreover, all the ACs were single rooms used for multiple purposes with the same room often used as a library and for consultation. These practices were associated with inconveniences such as inadequate privacy, overcrowding and poor ventilation:

The space at the adolescent clinic is too small, whenever we (adolescents) come in our numbers, like health talk days, there is always overcrowding. Sometimes we have no choice but to stand outside the room where you cannot even hear what the nurse is saying. Female, 14 years, student

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11</td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>11–13</td>
<td>6</td>
</tr>
<tr>
<td>14–16</td>
<td>8</td>
</tr>
<tr>
<td>17–19</td>
<td>10</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>No education</td>
<td>2</td>
</tr>
<tr>
<td>Primary school and below</td>
<td>4</td>
</tr>
<tr>
<td>Junior high school</td>
<td>12</td>
</tr>
<tr>
<td>Secondary/Vocational</td>
<td>6</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Schooling</td>
<td>19</td>
</tr>
<tr>
<td>Not schooling</td>
<td>5</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
</tr>
<tr>
<td>Christianity</td>
<td>11</td>
</tr>
<tr>
<td>Islam</td>
<td>8</td>
</tr>
<tr>
<td>Traditional</td>
<td>5</td>
</tr>
<tr>
<td>Residential status</td>
<td></td>
</tr>
<tr>
<td>Stay with parent(s)</td>
<td>17</td>
</tr>
<tr>
<td>Stay with non-parents</td>
<td>7</td>
</tr>
</tbody>
</table>

Table II. Socio-demographic characteristics of the respondents

Source: Field data (2017)
There is too much heat in the room (adolescent clinic). I wish they fix air conditioners or fans in the room to keep it cool for us (adolescents). Male, 19 years

Shortage of medicines and supplies. Adolescents perceived that resources like medicines and supplies were insufficient. They claimed that there were times they did not get prescribed drugs and supplies like condoms from the ACs. The adolescents emphasised that sometimes they had to buy supplies from pharmacies. Some adolescents added that they were not employed and therefore could not afford these commodities:

Some time ago I used to get drugs from the adolescent clinic for free. But, now I do not get the drugs for free. I have to buy from the drug store (community pharmacy), but I am a student and not working. Female, 19 years

The nurses tell us not to have sex without a condom. But sometimes, I can request for condoms and the nurses will tell me that it is finished. I do not feel happy to hear that, especially when I have a “match” (want to have sex). Male, 18 years

Inadequate resources. Also, adolescents perceived that the libraries of the ACs were poorly resourced. While some adolescents found it difficult to borrow the health information materials from the ACs, others stated that the information materials were few and not comprehensive. Entertainment facilities like games and televisions were also perceived to be lacking at the ACs:

We (adolescents) usually want to visit the library to read, but the books are few and the chairs and tables are not many. Also, the books in the library are very old, dirty and scanty, they do not look attractive. The hospital (AC) should buy new books and more furniture for adolescents who want to come to the clinic to read. Female, 18 years

The adolescent clinic is too boring. There are no entertainment facilities at the clinic. Sometimes I want to come to the clinic to play games or watch adolescent health videos, but some of these things discourage me. Male, 13 years

Inconvenient operating hours. Inconvenient operating hours also emerged as a facility-level barrier to accessing adolescent health services. Adolescents indicated that the ACs operated between 8 a.m. and 2 p.m. on weekdays only and did not operate on weekends and public holidays. Some adolescents felt that the operating hours

<table>
<thead>
<tr>
<th>Main Themes</th>
<th>Sub-themes</th>
<th>Illustrative quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility-level barriers</td>
<td>Inadequate physical space and privacy</td>
<td>[…] when [adolescents] come in their numbers there is overcrowding at the [clinic]</td>
</tr>
<tr>
<td></td>
<td>Inconvenient operating hours</td>
<td>[…] the [adolescent clinics] do not operate on weekends when [we] are at home</td>
</tr>
<tr>
<td></td>
<td>Shortage of medicines and supplies</td>
<td>[…] the [nurses] at the [ACs] are rude to [adolescents]</td>
</tr>
<tr>
<td>Provider-level barriers</td>
<td>Disrespect</td>
<td>[…] the [providers] attend to their friend first before others</td>
</tr>
<tr>
<td></td>
<td>Discrimination</td>
<td>[…] parents would not allow [adolescents] to visit the clinics […]</td>
</tr>
<tr>
<td>Community-level barriers</td>
<td>Lack of parental support</td>
<td>[…] [people] […] thinks [adolescents] visit […] for condoms […]</td>
</tr>
<tr>
<td></td>
<td>Negative perceptions</td>
<td>[…] [adolescents] do not know about the [clinic], what [clinics] do […]</td>
</tr>
<tr>
<td>Personal-level barriers</td>
<td>Fear</td>
<td>[…] [adolescents] are afraid of been chastised by [providers]</td>
</tr>
<tr>
<td></td>
<td>Lack of information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Financial challenges</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field interviews (2017)
were not convenient for them, because they were students and were in school during those hours:

The nurses who work at the adolescent clinic come in the morning and close in the afternoon. The adolescent clinic is not opened on holidays and weekends. I am a student and cannot leave my classes (studies) and visit the adolescent clinic. Male, 15, student

I am free on weekends only but the clinic is not opened on weekends, so how do I come here? I think they should do something about this or else some of us cannot visit the clinic. The clinic [adolescent clinic] should operate on weekends and late afternoon, so that I can have access to services provided at the clinic. Female, 14 years, student

Long patient waiting time. Long patient waiting time was also found to be a key facility-level barrier, especially for pregnant adolescents. Some pregnant adolescents indicated that they had to go through the usual antenatal routine, such as health talks and taking of vital signs before they were separated and attended to by an adolescent health care professional. On average, a pregnant adolescent spent about 3 h to access antenatal care:

I stay far from the hospital (AC). If I (pregnant adolescent) want to go home early, I have to reach here (the facility) as early as 5:30 am in order to avoid long queues and unnecessary delays. This is because the pregnant women who visit this hospital are too many. Female, 18, pregnant

Community-level barriers. Lack of parental support. Some respondents expressed worries about the lack of parental support for them to access adolescent health services. They were afraid that their parents may punish them if they found out that they visited the AC:

I always want to come to the adolescent clinic but if my parents find out that I come to the clinic, they will beat me and warn me not to step foot here again. Because of that am always afraid to come to the adolescent clinic. Today, for instance, I was able to come here (AC) because they (parents) are not at home. Female, 14 years

My mum warned me not to visit the adolescent clinic because someone had told her that adolescents go there for condoms and abortions. Therefore, my parents will not allow me to come to the adolescent clinic, because they think I will become a “bad girl”. I am able to come here (AC) today because my teacher accompanied me. Female, 15 years

Negative perceptions. Adolescents who accessed health care from the ACs were inevitably labelled or tagged with “bad names”. Adolescents stated that community members perceived adolescents who visited the clinics as “bad” boys and girls. Some community members had the perception that adolescents visited the ACs for contraceptives and abortion services. Because Ghanaian society frowns upon premarital sex, adolescents who were afraid of being labelled as “bad” stayed away from the ACs:

People in this community think negative of adolescents who visit the AC. They think we come here to do abortion or collect condoms. Because of that, I do not want people to see me when am coming to the clinic. They may think am coming for a pregnancy test or an abortion and may call me a bad girl. Female, 18 years

Peer influence. Some adolescents experienced restrictions from friends and lovers when they tried visiting the AC for the first time. Some adolescent girls indicated that their boy lovers warned them not to visit the adolescent clinic:

I was a regular client of the adolescent clinic, but when I met my boyfriend (lover), he warned me not to visit the clinic anymore, because if people see me they will think am a bad girl. He even told me he will break up with me if I go contrary to his warning. Female, 18 years

When I wanted to visit the adolescent clinic for the first time, my friend warned me to stay away, because, someone from the community had told him that adolescents visit the clinic for sex education and contraceptives. Male 17 years
Provider-level barriers. Disrespect for adolescents. Some adolescents were not comfortable with the attitudes of some health providers. Adolescents indicated that some of the health care providers did not respect their views and talked to them in a disrespectful manner:

Some of the nurses in the clinic are rude and disrespectful, especially to us, the pregnant adolescents. They do not respect our opinions. Also, they shout on us and call “names” (offensive word). This makes it difficult for me to ask them questions. Female, 17 years

Discrimination. Discrimination also emerged as a barrier to using adolescent health services. Adolescents indicated that some of their colleagues were given preferential treatment. Moreover, some adolescents claimed that they were denied health care:

During my last antenatal visit, the nurse (health care provider) asked me to do a laboratory test, but my “boyfriend” did not get money for me to go for the laboratory result. The nurse refused to attend to me because of my laboratory result was not available. Female, 17 and pregnant

The nurses in this facility (AC) are not fair at all. If you come early and your card (patient folder) is on top, someone who comes later and knows (related to) a nurse can be attended to before you. I do not know any nurse, so anytime I come for the antenatal care I always go home late. I think they have to talk to the nurses to treat everybody equally. Female, 19 years and pregnant

Judgemental attitudes. In addition to disrespect for adolescents and discrimination emerged judgemental attitudes from health care providers. Adolescents stated that some health care providers judged them, especially pregnant adolescents and called them names like “bad girl”. This does not promote adolescent-friendly care and therefore has to be discouraged:

One day I requested for a condom from one of the nurses and she told me that I am a bad boy and that what I was going to do with a condom. She told me to concentrate on my studies and stop chasing small girls. Male, 19 years

I remember that on my first antenatal visit some of the nurses were reluctant to attend to me. One nurse asked me why I got pregnant at this tender age and that I was a “bad girl” who did not pay heed to my parents’ and teachers’ advice. Female, 16 years

Personal-level barriers. In addition to the above-mentioned barriers, it emerged that adolescents had their personal challenges that restricted them from accessing health services. Three sub-themes emerged under this major theme and include fear, inadequate information and financial constraints.

Fear. Adolescents claimed that some of their peers were afraid to visit the AC. They perceived the fear of not being welcomed by health care providers as a barrier to accessibility. Adolescents indicated that some of their peers have similar perceptions which discourage them from accessing health care services:

Before I visited the adolescent clinic, I was afraid that the nurses would not be comfortable discussing sex-related issues with me. But after visiting the clinic that negative thinking disappeared. There are “young” people like me in the community who have similar perceptions. Male, 18 years

Lack of information. Lack of information also emerged as a barrier to accessing adolescent health services. It was revealed that some adolescents did not visit the ACs because they were not aware of its existence:

Some of our peers do not visit the adolescent clinic because they do not know it exists in this community. For instance, I have lived in this community for long but never heard of the adolescent clinic until a nurse from the clinic visited our school to educate us on adolescent health issues. I believe there are other adolescents like me who have not heard about the clinic. Female, 17 years
Financial challenges. At last, adolescents stated financial challenges as one of the factors that discouraged them from using the AC frequently. Adolescents who stayed far from the ACs complained about the high cost of transportation:

“I stay very far from the where the clinic is located and therefore cannot walk to the clinic. I have to “pick” two trotros (commercial transport) before I can get here (clinic). […] I am not working (employed) and therefore cannot afford trotro all the time. Female, 16 years

Discussions and implications
Consistent with extant studies, negative provider attitudes were found as a major barrier to using adolescent health services[25–27]. Adolescents are more likely to seek or continue with care if they perceive providers to be adolescent friendly[16]. In addition, adolescents will not hesitate to disclose sensitive information about their health to providers who are non-judgemental[28]. Therefore, there is a need for health care managers or supervisors of the ACs to reinforce or encourage adolescent-friendly attitudes among adolescent health care providers. This can be achieved through the use of incentives, negative reinforcement or on the job training[12].

Another barrier to accessibility and utilisation in this study was the lack of adequate physical space and privacy at the ACs[5, 13, 1, 29–31]. Adolescents attach much importance to their privacy and may not access health services if they perceive that health facilities cannot guarantee them adequate privacy[15, 32]. In addition, shortage of medicines and supplies, long waiting times and inconvenient operating hours were also found to be barriers to using adolescent health services. These have been documented by prior studies[13, 25, 29, 33, 34]. Improving resource availability in health facilities has been found to be significantly associated with adolescents’ utilisation of health services[12, 35]. Moreover, the poorly equipped nature of the adolescent libraries was also found to be a barrier to accessing adolescent health information. Moreover, adolescents expressed concerns about the scanty nature of the health information materials. These findings suggest that to improve access to adolescent health services, it would be necessary for health care managers to consider expanding and resourcing the ACs coupled with reducing patient waiting time and reviewing the operating hours.

Furthermore, negative perceptions of community members and low parental support were found to be major barriers to accessing ACs. Studies have confirmed disapproval by parents and community members as a barrier to adolescents’ access to reproductive health services [16, 25]. Chandra-Mouli et al[36] found poor community support for adolescents’ contraceptive use in LMICs. Adolescents are mostly not independent, and therefore may require the approval or consent of their guardians or parents before they can access health services. In this regard, involving community leaders and parents in the decisions regarding adolescent health care is ideal. Denno and Hoopes[37] recommended that effective approaches should be implemented to enhance community acceptance of adolescent health programmes.

Last but not the least, the findings revealed that adolescents’ access to health services is restricted by personal challenges such as fear, and lack of information about adolescent health facilities. Prior studies found fear, stigma, shame and lack of information as major barriers to accessibility and utilisation of adolescent-friendly health care in Zambia, Vanuatu and South Africa[12, 16, 38]. This study suggests that health interventions geared toward improving accessibility and utilisation of health services among adolescents should consider awareness creation and means of allaying the fears of adolescents through outreach activities in schools and communities.

Conclusion
Improving access to primary health care to all manner of persons is a global dream. However, the realisation of this dream may be delayed if efforts are not made to reach out to
underserved populations like adolescents. The purpose of this study was to explore barriers to accessibility and utilisation of adolescent health services. It was found that adolescents encountered negative provider attitudes, inadequate resources in adolescent health facilities, weak parental and community support for adolescent health interventions and personal constraints. This study provides useful information for health policymakers and practitioners, especially those whose remit includes adolescent health. That notwithstanding, the study has limitations such as the research approach. Qualitative studies are not ideal for generalisations, therefore, a generalisation of the findings should be used with caution.

References


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A study of the self-perceived competencies regarding the knowledge and skills of healthcare providers in the Expanded Program on Immunization in Thailand

A mixed-methods study

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Abstract

Purpose – The Expanded Program on Immunization (EPI) has still been found to offer services that do not comply with standards. The purpose of this paper is to ascertain competency in terms of the knowledge and skills of the EPI staff.

Design/methodology/approach – The research design was a mixed-methods approach. The quantitative method employed a questionnaire survey on the perceived competency of 382 EPI staffs from six regions in Thailand. This was paired alongside of the qualitative method, where four staffs were in-depth interviewed, and the performance of the EPI staffs was observed.

Findings – The overall perceived competency in the work of immunization was at a high level. A comparative analysis between the quantitative and qualitative data showed findings in three categories. First, the perception of competency was high, and performance conformed to standards in the preparation of the setting and equipment for providing the service; second, the perception of competency was high, but in the performance of their work the participants did not comply completely with standards for scheduling the immunization appointments or for vaccine storage; and third, the perception of competency was either moderate or low, and the performance of work was inadequate for vaccine estimations, registering reports, and dealing with adverse events following immunization.

Originality/value – The findings showed a gap between perception of knowledge-and-skill competency and actual practice in EPI service provision in Thailand. Effective cooperation among involved organizations in order to improve the standard of performance in expanding the quality of EPI service provision in Thailand is suggested.

Keywords Health care providers competencies, Competency, Expanded Program on Immunization, Thailand

Introduction

Immunization lies at the core of the control and prevention of major communicable diseases in Thailand. The provision of the Expanded Program on Immunization (EPI) in Thailand has received the praise of the World Health Organization as one of the 13 countries...
worldwide to have met with success in developing a vaccine-preventable disease-monitoring system for child immunization[1]. The policy has required that from birth, Thai children receive primary immunization against 11 diseases, aimed at the ultimate eradication and elimination of vaccine-preventable communicable disease[2]. In order to achieve its main objective, the successful development of EPI in Thailand has depended on the following four components: the vaccine component, produced in accordance with set standards; the budgetary component, which supports the production and research of new vaccines that will stay abreast of newly occurring diseases; the administrative component that manages production, storage and delivery and management within the service units; and personnel or providers engaged in immunization, which is a very important component inasmuch as it functions as the main mechanism and lies at the very heart of the process that will steer the EPI's aims toward achieving its objective[3].

It is currently estimated that there are approximately 20,000 EPI staff members in Thailand. However, it was discovered that there are regular personnel transfers in this line of work, causing the services being provided in the area of immunization to frequently fluctuate. Moreover, the nature of this line of work requires the development of continually updated knowledge and skills in rendering services, since the specialized knowledge needed in the administration of vaccines continually undergoes change, and new concepts are constantly arising. For this reason, staff engaged in the work of immunization are crucial to the mechanism that will determine whether the process of immunization in Thailand will achieve the desired work standard. A review of the service standards pertinent to the work of immunization found that carrying out this work in Thailand still had problems of several kinds. Based on information gleaned from the supervision of work performed in the area of immunization by the Department of Disease Control, issues were still found pertaining to services that did not comply with standards, such as the vaccine management system and the cold chain system, which continued to be non-standard compliant[4]. The aforementioned data were either a reflection of human error, incorrect understanding or low skills. Therefore, it is crucial that the managers of the immunization program, especially in the provider group in Thailand, be at least minimally aware of knowledge-and-skill competency levels and how immunization services are provided.

To date, numerous studies have been carried out on parental attitudes toward immunization and healthcare providers[5–7], the vaccination competency of nurse students and nurses[8–10] and knowledge or vaccination competency from the perspective of immunization providers and clients overseas, especially in western countries[11–13]. However, there is no available research on the knowledge and skills of those providing immunization services in Thailand. Consequently, this research describes a systematic study that will provide accurate data on the knowledge-and-skill competency awareness of service providers. These data were gathered in six regions of Thailand to provide an overall picture nationwide. Research findings can serve as empirical evidence for policy setting, and for a plan of work or for guidelines for furthering the capabilities of personnel on a level consistent with the expected competency of a provider. This information can then be applied to the development of work in a continuous and systematic fashion, and contribute to bringing the work of immunization to a greater level of success than before.

Methods
Study design and participants
This study used a mixed-methods approach using a triangulation convergence model. For the convergence model, the researchers collected and analyzed quantitative and qualitative data separately and then the quantitative and qualitative findings were converged by comparing and contrasting findings during the interpretation[14].

In the quantitative method phase, participants were EPI staff consisting of physicians, nurses, pharmacists, public health scholars and public health officials. The sample size was
determined using the G*power program 3.1.9.2. software. A sample size of 272 persons was required to achieve a power of 0.95 and an effect size of 0.2 at the $\alpha$ level of 0.05. Because the response rate in the postal mail survey was usually low, the sample number was increased by 50 percent. Therefore, the sample size that was expected to be used contained a total of 408 persons, requiring data to be compiled using the stratified random sampling method. Data were taken from those performing the work in six regions nationwide. One province was then selected from each region: Chon Buri in the East, Phetchaburi in the West, Chiang Mai in the North, Krabi in the South, Khon Kaen in the northeast and Bangkok in the central region.

For the qualitative methods phase of this study, four healthcare providers involved in immunization service from one health service setting in each region were selected through purposive sampling for in-depth interviews and non-participant observation. In summary, six health service settings were included in this phase and 24 healthcare providers from the six regions were interviewed and observed while performing their EPI services.

**Research instruments**

Two research instruments were employed: the demographic questionnaire and the Perceived Self-Competency for EPI Service Provision Evaluation Form for the quantitative phase of the study. Guidelines for the in-depth interviews and for the observations were used in the qualitative phase.

A demographic questionnaire was used to obtain personal data on the EPI staff, including sex, age, education level, length of time working in the field of immunization and characteristics of work.

The Perceived Self-Competency for EPI Service Provision Evaluation Form was developed by the researchers for measuring the staff member's perception of his/her competency in performing the work of immunization, including the self-confidence of the person in his/her knowledge and skill in rendering the service and managing the work of immunization. This tool contained a total of 80 questions covering the competency of EPI service based on the standard of service for the EPI training program of the National Vaccine Institute and the quality standards for immunization practices in the Department of Disease Control, Thai Ministry of Public Health. This instrument rated each item by using a five-point Likert scale that ranged from 1 (indicating no confidence) to 5 (indicating high confidence). The score results were subdivided into three levels based on criteria derived from Best’s criteria[15]. These were 1.00–2.33, which meant a low perception of competency; 2.34–3.67, which meant a moderate perception of competency; and 3.68–5.00, which meant a high perception of competency. Content validity was assessed by five experts. The Index of Item Objective Congruence (IOC) was 0.98. The result of the internal consistency using the Cronbach’s $\alpha$ was 0.97.

In-depth interview guidelines for the EPI staff were used pertaining to the perceptions of competency in EPI service. The interview guidelines included five items: How do you usually provide immunization services?; As an EPI staff member, how confident are you in providing immunization services?; Which performance do you have high-perceived competence in and which do you not?; What kind of difficulties have you encountered? Why?; and What are your expectations regarding the development of your knowledge and skills in providing immunization services? Instrument quality was assessed for content validity by five experts and tested by two EPI staff members in order to ascertain their understanding of the questions.

The Evaluation for EPI Service Observation Guidelines was used to assess the work being performed in a well-baby clinic. The guidelines contained a 51-item checklist that needed to be followed and monitored for the EPI service and was developed based on the evaluation forms for the quality standards for immunization practices, Department of Disease Control. Content validity was assessed by five experts and reliability was high (IOC = 0.91, inter-rater reliability = 0.90). The skills in providing immunization service and
all activities encountered by an EPI staff member were also collected through field notes that the researchers took during observation. Field notes were written while the researchers were observing.

**Data collection**

For the quantitative method phase, the questionnaires, consisting of the demographic questionnaire and the Perceived Self-Competency for EPI Service Provision Evaluation Form, were sent out to approximately 70 EPI staff members in each province in the six regions – Chon Buri, Phetchaburi, Chiang Mai, Krabi, Khon Kaen and Bangkok – by postal mail, and 91 percent of them – 382 persons – returned their questionnaires.

For the qualitative method phase, the researchers selected the participants from an EPI service unit in each of the randomly chosen provinces as they did with the quantitative data. Four EPI staff members in the selected service unit were purposively recruited as key informants per unit. The purpose of this phase was to conduct interviews and non-participant observation on the work being performed in the area of immunization by using the in-depth interview guideline for the EPI staff and the observation guideline. During observation, the researchers took field notes to record the activities undertaken that may not have been identified from the audio recording.

**Data analysis**

Data from the quantitative method were analyzed by using SPSS version 22 with the level of significance at 0.05 in order to describe the frequency and percentage of the demographic data and the perceptions of competency in the administration of immunization of the EPI staff. The data derived from the qualitative method consisted of data based on behavioral observations for which frequencies and percentages were calculated. Additionally, the data from the interviews and field notes from each observation were analyzed using content analysis[16]. The qualitative data analysis was joined with the quantitative data (triangulation) by comparing the two data types in order to arrive at the research results.

**Ethical considerations**

This research was approved by the Second Ethics Subcommittee on Human Research, Thammasat University, No. 024/2558. The information sheet that explained the data were sent to those that had joined the research project and to everyone in the sample groups in order to explain the details of the project and the protection of rights that applied to the sample groups. All participants who agreed to be a part of this study were required to sign the consent form that was then returned by postal mail together with the questionnaire.

**Results**

Regarding the quantitative method phase, among the total of 382 participants, 320 were female (83.8 percent) and 62 were male (16.2 percent), with an average age of 40.8 ± 9.04 years. Results showed that 21.5 percent of the participants were between the ages of 36 and 40 years, followed by 18.3 percent that were within 41–45 years of age. Furthermore, 77 percent of the participants had finished their education at bachelor’s degree level. A 68.3 percent majority of the participants were working in the nursing profession, followed by an estimated 19.1 percent of individuals who were public health staff members. The average length of time spent working in the area of immunization was 7.3 years (SD = 6.8), with 43.7 percent of the participants having worked from one to five years, followed by 23.0 percent that worked from 5.1 to 10 years. As regards the workplaces, 48.5 percent of the participants worked in primary healthcare centers or in
health-promoting hospitals in sub-districts, followed by 26.4 percent that worked in community hospitals. Additionally, 70.4 percent of the participants had been previously trained on an immunization course.

Results for levels of competency regarding knowledge and skills

The results for the quantitative data showed that the participants had a high perception of knowledge-and-skill competency in EPI service. They had an average score of 3.95 (SD = 0.61). When compared to the competency score as classified by EPI service, it was found that the participants had the highest perceptions of competency in preparing and administering the vaccines (\( \bar{x} = 4.12, SD = 0.69 \)), followed by vaccine storage and cold chain system (\( \bar{x} = 4.05, SD = 0.71 \)), and the lowest perceptions of competency in dealing with adverse events following immunization (\( \bar{x} = 3.82 \)). The details are as shown in Table I.

Results for behavioral observations of performing immunization services

The results for non-participant observations of the performance of EPI services showed that what the participants did was either incomplete or incorrect according to standards for administering the vaccines, vaccine storage, vaccine estimation and vaccine report registration, and dealing with adverse events following immunization. Details are shown in Table II.

The qualitative findings of both observational and interview data revealed that the participants were confident in their skills in administering the vaccine shots. They also felt that they were proficient in their work and in developing work standards in the areas of vaccine storage based on the cold chain system. On the other hand, participants were not confident in their performance of the following: scheduling immunization appointments for a group that was afflicted with health problems or that had come in for vaccinations later than the time appointed; vaccine estimation and vaccine report registration; and caring for adverse events following immunization.

Both quantitative and qualitative findings were used to summarize the knowledge-and-skill competency of the EPI staff members in Thailand. This summary proceeded as indicated below.

Category 1: those involved in the work had high competency perceptions. The work they performed conformed to standards of preparation of the site and equipment for vaccine services and in reporting to parents on giving vaccines. The details are shown in Table III.

Category 2: while those doing the work had high competency perceptions, the work they did was either incomplete or incorrect according to standards for providing services and for vaccine storage. The details are shown in Table IV.

<table>
<thead>
<tr>
<th>Perception of the person’s immunization competency</th>
<th>Possible score</th>
<th>Actual score</th>
<th>( \bar{x} )</th>
<th>SD</th>
<th>Interpretation of results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making preparations and administering the vaccines</td>
<td>1–5</td>
<td>1–5</td>
<td>4.12</td>
<td>0.69</td>
<td>High</td>
</tr>
<tr>
<td>Vaccine storage and cold chain system</td>
<td>1–5</td>
<td>1–5</td>
<td>4.05</td>
<td>0.71</td>
<td>High</td>
</tr>
<tr>
<td>Communicable diseases that are preventable by</td>
<td>1–5</td>
<td>1–5</td>
<td>4.00</td>
<td>0.83</td>
<td>High</td>
</tr>
<tr>
<td>vaccines and EPI scheduling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic knowledge pertaining to immunization</td>
<td>1–5</td>
<td>1–5</td>
<td>3.91</td>
<td>0.67</td>
<td>High</td>
</tr>
<tr>
<td>Vaccine estimation and vaccine report registration</td>
<td>1–5</td>
<td>1–5</td>
<td>3.87</td>
<td>0.80</td>
<td>High</td>
</tr>
<tr>
<td>Dealing with adverse events following immunization</td>
<td>1–5</td>
<td>1–5</td>
<td>3.82</td>
<td>0.68</td>
<td>High</td>
</tr>
<tr>
<td>Overview of a person’s perception of competency</td>
<td></td>
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<tr>
<td>regarding immunization</td>
<td>1–5</td>
<td>1–5</td>
<td>3.95</td>
<td>0.61</td>
<td>High</td>
</tr>
</tbody>
</table>

**Note:** \( n = 382 \) persons
Category 3: although the participants had a high perception of their knowledge-and-skill competency in all aspects of EPI service, they had the lowest of the three levels of perceived competency as follows: administering basic life support, and referring the patient when adverse reactions occurred; identifying the severity of symptoms following immunization and reporting the coverage for routine vaccination services. Their work was either incomplete or incorrect according to standards for making vaccine estimations, registering reports and dealing with adverse events following immunization (Table V).
The participants had the highest perceptions of competency in scheduling the immunization appointments, health assessment and vaccination screening (contraindications and precautions). The participants had confidence in scheduling appointments and in their skills in administering vaccine shots. “Our greatest confidence is in giving the shots and scheduling the immunization appointments in a healthy child. We are 100% capable of this because we generally prepare the vaccines ourselves and we do so rather precisely.” However, the participants were not confident in scheduling the immunization appointments in the groups of clients that had health problems, or that had come in for their vaccinations later than scheduled. “On scheduling the appointments for children who delayed routine vaccination, we’re still not confident in answering everyone’s questions. We don’t remember everything completely.” “We’d like to know more about vaccinations in general practice, vaccine contraindications, for instance, persons with immunocompromising conditions, which vaccines should patients receiving chemotherapy get, and minimum intervals between doses for children whose vaccinations have been delayed.”

There was a level-2 high awareness of competency in vaccine storage and of the cold chain system, comprising vaccine preservation, temperature control and regulations and emergency management of the cold chain system. The participants were confident in their work and eventually developed work standards in the area of vaccine storage that was based on the cold chain system. “We developed a vaccine storehouse. We developed it according to the curriculum and standards in the Drug Repository. So we tried to make use of the results we got to improve our work.” “The part where we were confident was in the cold chain because it involved pharmaceutical work. We were in pharmaceutical work all along and we had a better understanding of registering the Hos XP data reports in the forms. We knew the reasons in doing this work and we were able to link to it so we could apply it to our work.” “We were able to manage even when there was a power outage; and we were able to carry on, following the guidelines for maintaining the cold chain system in health-promoting hospitals in sub-districts.” Suitable refrigerators were chosen, and each type of vaccine was made available separately with a label indicating the name of each. Yet, there were some things that were done incorrectly, namely: The arrangement of the vaccines in the refrigeration unit was not correct according to principles for proper storage, since, in some places, different types of vaccines were being stored together. At times, there was no recording of refrigeration temperatures from morning to evening because the recording came to a stop on the weekends, there were no shift workers on duty and there were no vaccines kept in stock. No water bottles or cold packs had been put inside the refrigerator, only other medical supplies within the refrigerator walls. The two settings had no emergency management support plan in their cold chain systems.

<table>
<thead>
<tr>
<th>Quantitative data</th>
<th>Interview data</th>
<th>Observational data</th>
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<tr>
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<td>The participants had confidence in scheduling appointments and in their skills in administering vaccine shots. “Our greatest confidence is in giving the shots and scheduling the immunization appointments in a healthy child. We are 100% capable of this because we generally prepare the vaccines ourselves and we do so rather precisely.” However, the participants were not confident in scheduling the immunization appointments in the groups of clients that had health problems, or that had come in for their vaccinations later than scheduled. “On scheduling the appointments for children who delayed routine vaccination, we’re still not confident in answering everyone’s questions. We don’t remember everything completely.” “We’d like to know more about vaccinations in general practice, vaccine contraindications, for instance, persons with immunocompromising conditions, which vaccines should patients receiving chemotherapy get, and minimum intervals between doses for children whose vaccinations have been delayed.”</td>
<td>The majority of the providers could schedule vaccination appointments with normal cases but they were unable to schedule an appointment with clients that had health problems or delayed routine vaccination. Moreover, the work they did was about 83.3% correct and complete in terms of vaccination screening, whereas some clients in the health service setting have not been screened for contraindications prior to administering any vaccine.</td>
</tr>
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</table>
Discussion

According to the results of the study that examined the perception levels of knowledge-and-skill competency in EPI service, it was found that the participants had high competency perception levels in EPI service provision (\( x = 3.95, SD = 0.61 \)). The reason may be that a 70.4 percent majority of the participants had previously received training in immunization, so they had gained practical knowledge in the administration of vaccinations from experts or from those that were qualified in this field, and then they passed on their own expertise. Nowadays, training programs – three-day programs and one-day programs – are usually completed annually by the Thailand National Vaccine Institute and Department of Disease Control. Many printed materials such as immunization handbooks, guidelines and textbooks are distributed throughout the country both in hard copy format and electronically uploaded files. The monitoring system in each Area Health is randomly carried out by the Division of Vaccine Preventable Disease, Department of Disease Control, on an annual basis. The participants thus acquired knowledge and experience from others and eventually developed a perception of their own competency[17, 18]. This corroborates a theory of Bandura[19], which offers a clear explanation of participant results, namely, that...
they had already been trained in immunization. The results indicate that they benefited significantly from good role models that had provided them with their knowledge and shared important experiences. Their output consisted of developing the knowledge of service providers and reducing problems and obstacles in work supervision through access to resources for counseling in the performance of their work. This generated clarity in the advice being offered and built up awareness of their job performance[20]. The fact that the participants had a high level of perception of competency in rendering their services in immunization may have resulted from their having worked for long periods of time, an average of seven years, and had an extensive amount of work experience. Furthermore, their experience was directly in the area of immunization, and they were bound to develop self-competency awareness to a high level. It was further revealed that the participants had the highest perceptions of competency in preparing and administering the vaccines, vaccine storage and use of the cold chain system. The above findings concur with a statement of Bandura, who asserted that performing a task successfully strengthens one’s sense of self-efficacy, thus leading to successfully accomplishing a task. In other words, having direct experience of mastering something is a powerful way of increasing one’s self-efficacy, and in this case, influenced the initiation and maintenance of vaccination competence[19].

Meanwhile, the participants had moderate and low perceptions of competency in the areas of administering care whenever adverse reactions following immunization occurred, and in making vaccine estimations and registering reports. The reason may be that the participants consisted mostly of nurses that had no specific duty or direct responsibility in these tasks. The very fact of never having had any experience in carrying out these functions or any specific duty or direct responsibility in carrying them out tends not to generate any perception of competency in work performance, and the work itself may be incomplete or non-standard. Yet, at the same time, there were participants with perceptions of competency that were high, but whose work was either incomplete or noncompliant with standards, especially in administering the vaccine shots and in their storage of the vaccines. There were other factors that affected their personal actions, including, in particular, environmental factors, or the context of the individual[21]. These factors led to job performance in which the results were not correct. For example, the arrangement of the vaccines in the refrigeration units was incorrect because of the limitation of the refrigeration equipment. There was no recording of the refrigeration temperature on the weekends from morning till evening, nor had any instruments been prepared to provide first-aid in the event of undesirable symptoms following immunization. Neither was a suitable space prepared for the observation of post-vaccination symptoms. This situation was the result of the work policies of the immunization units, which were very diverse. They depended on the context of the service sites and the affiliated principal work units. Accordingly, the immunization work systems were implemented in ways that generally differed. They may not have harmonized with the evaluation forms for the standards of the primary vaccine development group, Department of Disease Control, which served as the template in the construction of the research tools for the present study. Furthermore, the policy limitations within each of the work units caused the failure of budgetary support for the work unit itself and led to a shortage of personnel as well. These findings were consistent in that the nurses that were administering immunization shots were knowledgeable in their work, but were subject to certain limitations. Among these limitations was a lack of staff in the workplace, which impeded the services they were providing in administering the vaccines[22].

Conclusion
The data from this research indicated that the individuals engaged in this work have high-level perceptions of their own competency, which serves as a reflection of their knowledge and skill in immunization practices. Nonetheless, some problematic issues were
found in the work of the healthcare providers that conflicted with certain stipulated work standards. Accordingly, these findings serve as clear evidence of the need to develop the competency of EPI staff in order to overcome the barriers and to sustain effective services in Thailand.

**Recommendations**

This study provides insights into national organizations in Thailand including the Thailand National Vaccine Institute or the Division of Vaccine Preventable Disease and the Department of Disease Control. The study can support recommendations for planning staff development policy to enhance adequate and systematic training, monitoring and evaluation throughout the EPI staff’s working life. Moreover, the effectiveness of traditional training might be reviewed and added to new methods that will be able to overcome the constraints between high-perceived competence and unmet standard practices. Additionally, scheduling and rescheduling of immunization, vaccine storage in the cold chain system, vaccine administration and preparation for adverse effects following immunization should be more closely monitored.

**References**


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Effectiveness of increase health volunteer ability program in basic care for the dependent elderly in the communities, Nakhon Pathom Province, Thailand

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College of Nursing and Health, Suan Sunandha Rajabhat University, Bangkok, Thailand

Abstract
Purpose – The purpose of this paper is to study and compare knowledge and skills in basic care for the dependent elderly of health volunteers before and after the increase in ability program participation.

Design/methodology/approach – Quasi experimental research includes one group pretest-posttest design. The research was conducted from January to March 2018. The samples were 30 health volunteers in Nakorn Pathom Province selected by purposive sampling. They were all female, aged 20–50 years, with minimal education level of early secondary school and were current or former health volunteers. The increase ability program consisted of lecture and skill practice by demonstration and individual replay demonstration. The program duration was 30 h with 19 h of skill practice and 2 days of site visit to the dependent elderly’ homes.

The tool for collecting data was a questionnaire for the evaluation of knowledge and skills in basic care for the dependent elderly. The data were analyzed by means, standard deviation and paired t-test.

Findings – After the increase in ability program participation, the health volunteers had very good level of knowledge in basic care for the dependent elderly with statistical significance (p<0.01) and had most correct skills in basic care for the dependent elderly with a score of 9 from 11 items.

Originality/value – Knowledge and skills in basic care for the dependent elderly of the health volunteers increased to a very good level after program participation. Thailand should provide periodic and continuous training program to increase health volunteers’ knowledge and skills in basic elderly care to provide care for the elderly with most benefits.

Keywords Basic care, Dependent elderly, Increase health volunteer ability, Thailand

Paper type Research paper

Background
At present, Thailand is projected toward becoming a complete ageing society by 2021[1]. In 2016, Thailand had 10,014,699 (14.90 percent) of the population[2] who were 60 years old and above, which was the second highest proportion of elderly in the ASEAN countries, preceded by Singapore. In 2017, this number increased to 11,000,000 (16.50 percent) who made up the 60 years old and above population[3]. Two significant reasons for the rapid increase in the elderly population are as follows: decrease in the reproductive or birth rate, and increase in the life expectancy of Thai people. The life expectancy of men and women is currently 72 and...
It is predicted that, in the next 10 years, the life expectancy of men and women will be 76 and 83 years, respectively[1]. The impact on Thai society when the elderly population increases include a larger proportion of dependent elderly who need hospitalization, an increase in expense for medical supplies, increase in hospital beds and increase in the need for health personnel for elderly care. The impact on the elderly and their families include an increase in the dependent and bed-ridden elderly. In addition, the elderly who are still ambulatory must still be taken to the hospital for appointments by their sons, daughters or relatives. If they are not available to take the elderly, they have to hire motorcycles or vans making access to health services difficult[4]. Most of today’s elderly population do not have prior knowledge of health[5] and lack an income[6]. Therefore, it is a burden on the family to find caregivers to provide care to the elderly at home since hospitals are unable to support the rising and increasing needs of the growing elderly population. Thailand’s family status has gradually moved toward single families of which there is a 33.33 percent rate in the Nakhon Pathom Province. The Thai government’s awareness of ethics and the life values of the elderly have resulted in arrangements for health volunteers to provide care for the elderly to replace insufficient beds, health personnel and the increasing single-family status in the nation. The related law, legislated and published in the Royal Gazette in 2011, states that there will be a sustainable program to increase knowledge and a monthly salary for health volunteers as well as guidelines for health volunteer selection. Each village or community will select health volunteers from the people in the community who are willing to participate and devote time to public health work[7, 8]. If the health volunteers have adequate knowledge of basic elderly care, they should be able to better help the health teams and families. However, the health volunteer training projects for elderly care does not cover all areas and is not updated to current levels of medical knowledge and skills. There are increasing numbers of health volunteers, for example the Nakhon Pathom Province has 10,599 volunteers[9], who became volunteers before the Act in 2011 that required an increase in health knowledge of the health volunteers. Based on literature review, 50–70 percent of health volunteers were educated to primary and early secondary level[10–13]. They had insufficient essential knowledge and skills, so they were not confident in their care of the elderly[14–16]. It is, therefore, necessary to increase the health volunteer’s knowledge and skills related to the care of the elderly. Nakhon Pathom Province has 72,700 people who are 60 years old and above which is the sixth highest rate compared to the 26 provinces in Central Thailand, so it is necessary to increase knowledge and skills in elderly care amongst health volunteers[17]. This research aims at studying the effectiveness of the program to increase health volunteer ability in basic care for the dependent elderly in the communities of Nakhon Pathom Province.

**Research objectives**

The objective of this paper is to study the effectiveness of the program to increase health volunteer ability in basic care for the dependent elderly in the communities of Nakhon Pathom Province.

**Research hypothesis**

After participating in the program, the health volunteers had increased their knowledge and improved in their skills in the basic care of the dependent elderly compared to ratings before program participation.

**Research framework**

The researcher applied Bloom’s learning theory[18] as the program framework to increase the health volunteers’ abilities in basic care for the dependent elderly in the communities. Bloom classified individual learning objectives into three domains: cognitive domain – teaching to
achieve knowledge; affective domain – the attitude of learners toward the subject; and psychomotor domain – the ability to practice after learning. The researcher applied the cognitive domain by teaching the health volunteers about the present situation of Thai elderly, the concept of the elderly, diseases and symptoms in the dependent elderly and theory of skills needed to learn before practising basic health care skills for the elderly. But increasing knowledge in the cognitive domain is associated with each person’s affective domain that is defined as a feeling that occurs from a previous phenomenon. For the purpose of this research, the affective domain is the attitude of the volunteers toward basic health care services for the elderly. The psychomotor domain in this research involved teaching with a demonstration, individual replay demonstrations and essential skills practice to enable the health volunteers to provide basic health care to the dependent elderly. The program in this research applied Bloom’s learning theory of cognitive and psychomotor domains. Studies on the health volunteers’ attitude toward elderly care were conducted which showed different results. There were attitudes of high level[19, 20], average level [21, 22] and low level[23]. Since the health volunteers were selected by the villagers from the people who were willing to help the sick people in the communities[7], the researcher did not study the affective domain from Bloom’s learning theory[18]. The contents and skills of the elderly care were modified from the curriculum of the Health Promotion Bureau, Department of Health, Ministry of Public Health[24]. The research framework is summarized as shown in Figure 1.

**Methodology**

The research design was a quasi-experimental research study comprising of a single group pretest-posttest design.

**Population and samples**

The study population were 260 health volunteers in the communities of Nakhon Pathom Province. The selection criteria for study samples were: female, aged 20–50 years, educated to early secondary school and above and current or former health volunteers. There were 30 participants selected by purposive sampling with multistage random sampling from eight districts in Nakhon Pathom Province. The sample size of 30 was determined by Polit’s table[25] with a power of test = 0.80, confidence interval = 0.05 and an effect size = 0.60. The research tools were the following:

1. The program to increase the health volunteers’ ability in basic care for the dependent elderly was conducted by relevant lectures and knowledge content and skills practice by demonstration for at least three individual replay demonstrations. The total duration was 30 h with 12 h of skills practice and 2 days of site visits to homes of the dependent elderly. The skills practice sessions included vital signs measurement, sterile technique, care for daily activities, pressure sore wound dressing, drug use in the elderly, care for gastrointestinal problems, and care for respiratory problems, exercise and emergency assessment.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program to increase health volunteers ability</td>
<td>- Knowledge of health volunteers in basic care for the dependent elderly</td>
</tr>
<tr>
<td>- Knowledge concerning dependent elderly (cognitive domain)</td>
<td>- Skills of health volunteers in basic care for the dependent elderly</td>
</tr>
<tr>
<td>- Demonstration and replay demonstration of basic elderly care (psychomotor domain)</td>
<td></td>
</tr>
</tbody>
</table>

![Figure 1. The research framework with the relationship of independent and dependent variables](image-url)
The schedules of the program to increase the health volunteers' ability in basic care for the dependent elderly were made up of the following:

- **day 1** – lecture on the present elderly situation, the concept of the elderly, diseases and common symptoms in the dependent elderly, demonstration and replay demonstration of vital signs measurement, sterile technique and instrument cleaning;
- **day 2** – lecture, demonstration and replay demonstration of bedding for the active and inactive elderly, care for daily activities such as cleaning body, mouth, teeth, hair washing on the bed and body wiping for fever;
- **day 3** – lecture, demonstration and replay demonstration of wound types, wound dressing for general wounds, pressure sore wounds and tracheostomy wounds, drug use in the elderly, common drugs and side effects, insulin injection and dextrostix testing;
- **day 4** – lecture, demonstration and replay demonstration of care for the patients with gastrointestinal problems, preparing liquid diets, nasogastric tube feeding and care for the patients with respiratory problems; and
- **day 5** – lecture, demonstration and replay demonstration of exercise in bed and emergency assessment of the elderly.

Data collection tools consisted of the following:

- General information on the samples – age, occupation, education level, income, elderly care experiences and duration of health volunteer work. The forms consisted of multiple choice answers and filling in the blanks.
- Questionnaire for knowledge assessment with 25 items of true, false or uncertain answers: each item was scored 1 for the right answer and 0 for the wrong answer.
- Questionnaire for assessment of skills in basic elderly care: the items with most, average and least correct skills were scored 3, 2 and 1, respectively. There were six items for scoring criteria as follows: able to explain the objective; able prepare all tools of practising skills; able to tell how to prevent danger if error occurred; able to perform with sterile technique; able to complete every step; and able to perform with neatness.

Score interpretation is as follows:

- most correct skills (3) = complete fifth and sixth items;
- average correct skills (2) = complete third and fourth items; and
- least correct skills (1) = complete first and second items.

The research tools were checked for content validity by three experts. They were corrected as advised and tested with the volunteers who were not part of the sample group. The reliability index for knowledge was calculated by KR-20 and revealed $r = 0.89$. The skills of basic care for the elderly was calculated by Cronbach’s $\alpha$ coefficient and revealed $r = 0.90$.

Data collection of knowledge was conducted on the first day of program participation before lecture (pre-test) and on the last hour of the program (post-test). The skills of elderly care were assessed individually before demonstration (pre-test) and after the third replay demonstration (post-test).
Statistics for data analysis
First, personal information was analyzed by percentage. Second, knowledge and skills of basic care for the dependent elderly and pre and post-program participation were analyzed by the mean, standard deviation and paired t-test.

Protection of samples’ right
The research was approved for ethical consideration by Suan Sunandha Rajabhat University, Certificate Number COA 1-060/2017, and the researcher conducted the research with consideration of confidentiality and impact on the subjects throughout the research.

Results
The results showed:

Fifty percent of the samples were 30–40 years old, 53.33 percent were married, 66.67 percent were educated to early secondary school level, 33.33 percent had experiences in elderly care, 83.33 percent had experiences in health volunteer work and 23.33 percent had obtained basic elderly care training.

Before participating in the program, the health volunteers had a good level of knowledge in basic care for the dependent elderly. After program participation, they had a very good level of knowledge with statistically significant increase before the program (p < 0.01) as Table I. Before participating in the program, the health volunteers had a very good level of correct knowledge of 10 from 25 items (40.00 percent) and after program participation, they had a very good level of correct knowledge of all 25 items (100.00 percent). The ten items of very good level of correct knowledge both before and after program participation were: checking for an irregular pulse; bedding must be smooth to prevent pressure sores; turning off fan during wiping the elderly; never lift the urinary bag above the urinary bladder in the elderly with retained catheter; dark urine in the urinary bag indicates dehydration; cloudy urine in the urinary bag requires a doctor’s consultation; turning over the bedridden elderly every 2 h; dressing pressure sore wounds each time diapers are changed; sputum suction must be performed following a sterile technique; and emergency symptoms that need transfer to hospital are high fever, chill and high or low blood pressure.

Before program participation, the health volunteers had average correct levels of skills in basic care for the dependent elderly. After the program, they had improved correct levels of skills with statistically significant increase before the program (p < 0.01) as detailed in Table II. For each skill item after program participation, the health volunteers had the most correct levels of skills in basic elderly care of 9 from 11 items (81.81 percent). Before program participation, they had the most correct level of skills in basic elderly care of 1 from 11 items (9.09 percent) as detailed in Table III.

<table>
<thead>
<tr>
<th>Items</th>
<th>Full scores</th>
<th>Mean</th>
<th>SD</th>
<th>Scores level</th>
<th>Paired t-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge in basic elderly care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before program</td>
<td>25</td>
<td>17.40</td>
<td>3.47</td>
<td>Good</td>
<td>−8.65</td>
<td>0.001**</td>
</tr>
<tr>
<td>After program</td>
<td>25</td>
<td>22.56</td>
<td>2.04</td>
<td>Very good</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: n = 30. **p < 0.01
Discussion
The research showed the followed:

Before participating in the program, the health volunteers had a good level of knowledge in basic care for the dependent elderly. However, after program participation, they had a very good level of knowledge with a statistically significant increase in knowledge compared to before the program ($p < 0.01$) as shown in Table I. Before participating in the program, the health volunteers had a very good level of correct knowledge of 10 from 25 items (40.00 percent) but after program participation, their knowledge was correct on all 25 items (100.00 percent).

Before program participation, the health volunteers had an average level of correct skills in basic care for the dependent elderly. After the program, they had the most correct level of skills with a statistically significant increase compared to before the program ($p < 0.01$). For each skill item after program participation, the health volunteers had the most correct levels of skills in basic elderly care of 9 from 11 items (81.81 percent). This contrasts sharply with skills levels before participating in the program which was at 1 from 11 items (9.09 percent).

The results of this research complied with the research hypothesis. This showed that the program was effective in increasing the health volunteers’ ability. It is further consistent with the research of Sanprasan et al. [12] that found that after capacity building based on a participatory learning program, the health volunteers increased knowledge in cardiovascular diseases with statistical significance ($p < 0.01$). Each health volunteer had a very good knowledge level of basic care in patients with cardiovascular diseases, passed assessments for skills in cardiovascular evaluation and 100.00 percent of them had good

<table>
<thead>
<tr>
<th>Items</th>
<th>Full scores</th>
<th>Mean</th>
<th>SD</th>
<th>Scores level</th>
<th>Paired $t$-test</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skills in basic elderly care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before program</td>
<td>3</td>
<td>2.13</td>
<td>0.21</td>
<td>Average</td>
<td>$-11.24$</td>
<td>0.001**</td>
</tr>
<tr>
<td>After program</td>
<td>3</td>
<td>2.61</td>
<td>0.13</td>
<td>Good</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Notes:</strong> $n = 30$. <strong>$p &lt; 0.01$</strong></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills in basic care</th>
<th>Average scores before the program (full score = 3)</th>
<th>Average scores after the program (full score = 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{X}$</td>
<td>SD</td>
</tr>
<tr>
<td>Vital signs measurement</td>
<td>2.63</td>
<td>0.61</td>
</tr>
<tr>
<td>Sterile technique and cleaning instruments</td>
<td>2.06</td>
<td>0.44</td>
</tr>
<tr>
<td>Occupation bed</td>
<td>2.26</td>
<td>0.63</td>
</tr>
<tr>
<td>Care for daily activities</td>
<td>2.30</td>
<td>0.59</td>
</tr>
<tr>
<td>Urinary bladder care</td>
<td>2.02</td>
<td>0.49</td>
</tr>
<tr>
<td>Wound dressing</td>
<td>2.00</td>
<td>0.37</td>
</tr>
<tr>
<td>Drug use in the elderly</td>
<td>1.83</td>
<td>0.46</td>
</tr>
<tr>
<td>Care for patients with GI problems</td>
<td>2.13</td>
<td>0.34</td>
</tr>
<tr>
<td>Care for patients with respiratory problems</td>
<td>2.13</td>
<td>0.62</td>
</tr>
<tr>
<td>Exercise in bed</td>
<td>2.10</td>
<td>0.67</td>
</tr>
<tr>
<td>Emergency assessment</td>
<td>1.99</td>
<td>0.58</td>
</tr>
</tbody>
</table>

**Note:** $n = 30$
skills levels of basic cardiopulmonary resuscitation. It was also consistent with the research of Anunta and Tonganake[13], which found that the health volunteers’ knowledge and skills in home visits increased with statistical significance ($p < 0.01$) after training. This is also consistent with the research of Jitbantad et al.[10], which found that the health volunteers who joined the capacity building of community volunteers to be case managers of community-dwelling elderly with disabilities had an increase in knowledge theory and practice with the most increase in basic knowledge of elderly disabled rights (97.34 percent) and in health assessment and screening (95.78 percent). This result could be due to demonstration and individual replay demonstrations during which the lecturer divided the participants into groups of eight with close practice, supervision and explanation until the participants were confident enough to give care. The sample subjects were very interested in learning and were satisfied with program participation to a very high level.

**Conclusion**

After participating in the program, the health volunteers increased their knowledge and skills in basic care for the dependent elderly. This could help reduce the burden on the shortage of health teams in communities. Thailand should provide periodic and continuous training programs for health volunteers to increase their knowledge and skills in basic elderly care in order to provide optimum care for the elderly.

**Limitations**

This research could not be conducted by a quasi-experimental research involving the two group pretest-posttest design because the experiment duration was seven days. Furthermore, the experiment focused on increasing the basic skills in the elderly care of the subjects. The control group could not be totally controlled since they could easily access the knowledge media from YouTube and the internet. Additionally, the data collection of the control group was difficult because the subjects were scattered throughout Nakhon Pathom Province.

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Factors influencing the decision to choose a birth center by pregnant women in Gombe state Nigeria

Baseline survey
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Abstract

Purpose – Gombe state in northeast Nigeria records a high prevalence of home deliveries with very low facility deliveries despite the efforts of government and international non-governmental organizations in supporting maternal health services. The purpose of this paper is to assess the factors influencing the decision to choose a birth center by pregnant women in Gombe, Nigeria.

Design/methodology/approach – The design was a cross-sectional study of women from a baseline survey conducted in August 2016 in Gombe state, Nigeria. Data on women groups’ utilization of maternal services with a focus on antenatal care, delivery and postnatal care were collected using a structured questionnaire used for household survey conducted in the state. Data for 157 pregnant women from the sample of 750 women (15–49 years) were selected for the purpose of this analysis. Descriptive statistics, bivariate and multivariate analyses were used to determine the factors associated with choice of birth center.

Findings – Religion (AOR = 12.117, 95% CI 1.774–82.741), paid work (AOR = 3.633, 95% CI 1.243–10.615) and identification and knowledge of pregnancy complications (AOR = 4.281, 95% CI 1.054–17.387) were the factors found to be significantly associated with choice of birth center by pregnant women. Age, education, closeness to a facility and decision by husband or woman were not found to be statistically significant.

Originality/value – The significance of disseminating knowledge about pregnancy complications, role of religious leaders and encouraging savings from women earnings need attention of the government to improve facility-based delivery.

Keywords Pregnant women, Antenatal care, Postnatal care, Nigeria

Paper type Research paper

Background

One of the most important contributors to reducing maternal deaths, especially in low resource settings, is the effective management of the stages of labor during pregnancy and the possible complications arising therefrom. Complications of pregnancy and childbirths among adolescent women are leading contributors to maternal deaths in developing countries. This underscores the necessity of giving birth in health facilities with the support of skilled health workers who have the expertise to manage complications and make referrals to the next level of care where appropriate. Increasing the percentage of births delivered in health facilities is an important strategy to reduce maternal deaths[1].

In Nigeria, only about 36 percent of births take place in a health facility while 63 percent of women deliver at home[1]. Gombe state in Northeast Nigeria has poor maternal health indicators in comparison to the Southern part of the country where 71.4 percent of births...
take place at home with only 27.6 percent delivering in a health facility[1]. Recent findings from the multiple indicator cluster surveys in 2016–2017, by the National Bureau of Statistics and the United Nations International Children’s Emergency Fund puts the percentage of women (15–49 years old) that delivered in the health facility in Northeast Nigeria at 25.8 percent while 74 percent delivered at home. Gombe state recorded 68.4 percent home deliveries and 29.3 percent public sector deliveries[2].

In spite of the state government’s initiatives to increase access to essential maternal health services, disseminating key messages on the advantages of facility delivery and pregnancy complications, in addition to the training of health workers on interpersonal communication, home deliveries have persisted and therefore requires a policy solution[3]. Previous studies[4–6] have not established the predictors of choice of birthplace by women in the northeast region but, instead, have focused on the barriers to utilization of maternal services in other regions of the country.

A number of barriers have been found to limit pregnant women from utilizing health facilities as birth centers. Costs of services, transportation to the facility, ability to make decisions on the place of birth and religious and cultural practices are some of the factors found to be influencing the choice of place of delivery among women. Others include the region of residence and education level of the women[4, 6, 7]. In the Nigerian context, Idris et al[8] found that only 24 percent of women delivered in a health facility among women surveyed in a semi-urban northern Nigerian setting citing lack of pregnancy complications and the negative attitudes of health providers as their reasons.

Sudden onset of labor late at night, the absence of transportation and limited options for birth positions were also factors found to promote the high prevalence of home births[9]. A recent qualitative study found factors that discouraged women from giving birth at facilities to include knowledge, attitudes of the women and awareness of labor outcomes, community beliefs and previous birth experience[10]. Decisions taken jointly between the husband and wife were found to significantly favor undergoing delivery in a health facility compared to women taking decisions independently[11].

This study assessed the factors associated with the decision by pregnant women to utilize either health facility, home or other places as centers for giving birth from a baseline survey conducted in Gombe state, Northeast Nigeria.

Methods

Design and sampling strategy
The design was a cross-sectional study of women from a baseline survey conducted in August 2016 in Gombe state, Nigeria. Data on women’s utilization of maternal services with a focus on antenatal care (ANC), delivery and postnatal care were collected using an adapted questionnaire from the London School of Hygiene and Tropical Medicine used for their household survey conducted in the state[12].

In total, 750 of 15–49 years, participating in a women’s savings group were registered for an empowerment program in two purposefully selected local government areas of the state. All the pregnant women of the savings group members, totaling 157, were selected as the sample size for this analysis.

Statistical analysis
Analysis of the descriptive statistics for the pregnant women was completed. Thereafter, bivariate and multivariate logistic regression models were used to analyze the relationship between the plans for the current pregnancy with two options: plan to give birth in the health facility and plan to give birth in a place other than the health facility, and the independent variables.
The independent variables were socio-economic and demographic characteristics of the women: age, marital status, religion, education, occupation, paid work in the last seven days, previous pregnancy and membership of the women’s savings group. Availability and accessibility to the primary health care facilities and also decisions on money spending and health care utilization were included in the bivariate analysis.

All the variables that had a $p < 0.25$ from the bivariate analysis were entered into a multivariate logistic regression model. Data for this study were analyzed using an SPSS statistical package for Social Science version 22.

**Ethical consideration**

Ethical approval for this study was obtained from the Gombe State Ministry of Health Ethical Committee with approval letter reference: MOH/ADM/S/658/VOL.11/37 dated July 4, 2016.

**Results**

Table I presents the results of the characteristics of the pregnant women. 46 percent of the women were between the ages of 15 and 24 years and 36 percent between 25 and 34 years. In total, 82 percent were married with the remaining 20 percent in the category of single, widowed or divorced. Muslims constituted 73 percent of the sample while 27 percent were Christians. Only 29 percent of the sample had the ability to read and write in English but 58 percent had the ability to read and write in other languages (Hausa or Arabic). The majority of the women were unemployed (75 percent), 25 percent were recorded as employed while 42 percent reported engagement in paid work in the seven days preceding the survey.

In total, 86 percent of the women reported having been pregnant previously. The majority of them were between 1 and 12 weeks of gestation and 54 percent had received ANC already. About 23 percent had no knowledge of recognizing any signs of pregnancy complications while 23 percent could mention at least one sign. In total, 54 percent were members of the women’s saving groups. A primary health care center was available close by to 85 percent of the women, and the major means of getting to the facility for the majority of them (76 percent) was by walking to the facility. Decisions to spend the money earned by the women in 44 percent of cases were taken by their husbands while 17 percent of decisions were taken jointly with their husband with “others” as decision makers totaling 6 percent. Similarly, 44 percent of decisions to utilize health care services were taken by the husbands of the respondents alone and 45 percent of decisions were taken jointly with their husbands. The respondents took only 5 percent of the decisions alone and 6 percent of decisions were taken on their behalf by others. Those that planned to give birth in the health facility constituted 67.5 percent of the sample, with 32.5 percent of them planning to give birth elsewhere.

Table II shows the results of the bivariate analysis completed between the decision to choose a birthplace and independent variables of interest. Nine variables were found to be significantly associated with the decision to choose a health facility as a birthplace. Age (OR = 2.679, 95% CI = 1.215–5.905) and marital status (OR = 3.721, 95% CI = 1.051–13.168) had a significant association with the choice of place of birth. Women between the age of 25 and 34 years were more likely to deliver in the facility compared to those within 15–24 years. Single/widowed/divorced women were three times more likely to deliver in a health facility than married ones. Membership of the women’s saving group (OR = 2.177, 95% CI = 1.103–4.297) was significantly associated with the decision to deliver in the facility. Members have two times the odds of choosing a health facility as a birthplace compared to non-members. Religion (OR = 15.454, 95% CI = 3.564–67.007) was also found to have a significant association with the choice of place of birth.
<table>
<thead>
<tr>
<th>Characteristics</th>
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<tr>
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<td>Age (years)</td>
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<td>13–24</td>
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<td>Knowledge of pregnancy complications</td>
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<td>Could not mention any sign</td>
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<td>1 sign</td>
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<td>Availability of primary health care facility</td>
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<td>Time to reach a health facility (minutes)</td>
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<tr>
<td>&gt; 30</td>
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<tr>
<td>No plan to use facility</td>
<td>51</td>
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Table I. Characteristics of pregnant women
| Variables                  | Place for giving birth | 95% CI |  |
|---------------------------|------------------------|--------|
|                           | Health facilities (n)  | Non-health facilities (n) | OR | Lower | Upper |
| **Age (years)**           |                        |        |    |
| 15–24                    | 42                     | 30     | 2.679** | 1.215 | 5.905 |
| 25–34                    | 45                     | 12     | 1.508  | 0.600 | 3.788 |
| 35–49                    | 19                     | 9      |        |       |       |
| **Marital status**        |                        |        |    |
| Married                   | 86                     | 48     | 3.721** | 1.051 | 13.168 |
| Single/widowed/divorced  | 20                     | 3      |        |       |       |
| **Religion**              |                        |        |    |
| Islam                     | 65                     | 49     | 15.454*** | 3.564 | 67.007 |
| Christianity              | 41                     | 2      |        |       |       |
| **Education**             |                        |        |    |
| Ability to read and write in English |                |        |    |
| Unable                    | 71                     | 40     | 1.793*  | 0.821 | 3.912 |
| Able                      | 35                     | 11     |        |       |       |
| Ability to read and write in Hausa or Arabic |                |        |    |
| Unable                    | 41                     | 25     | 1.524*  | 0.777 | 2.991 |
| Able                      | 65                     | 26     |        |       |       |
| **Occupation**            |                        |        |    |
| Unemployed                | 77                     | 41     | 1.544  | 0.685 | 3.480 |
| Employed                  | 29                     | 10     |        |       |       |
| **Paid work in the last seven days** |                |        |    |
| No paid work              | 52                     | 39     | 3.375** | 1.593 | 7.150 |
| Had paid work             | 54                     | 12     |        |       |       |
| **Previous pregnancy**    |                        |        |    |
| No                        | 5                      | 17     | 10.100*** | 3.464 | 29.451 |
| Yes                       | 101                    | 34     |        |       |       |
| **Gestational age (weeks)** |                      |        |    |
| 1–12                      | 62                     | 47     | 13.645** | 1.758 | 105.893 |
| 13–24                     | 18                     | 1      |        |       |       |
| ≥25                       | 24                     | 3      | 6.065** | 1.723 | 21.351 |
| **Antenatal care utilization** |                   |        |    |
| Not received care         | 48                     | 24     | 1.074  | 0.550 | 2.099 |
| Received care             | 58                     | 27     |        |       |       |
| **Knowledge of pregnancy complications** |                |        |    |
| Could not mention any sign | 12                     | 24     | 2.538** | 1.340 | 9.343 |
| 1 sign                    | 23                     | 13     |        |       |       |
| 2 signs                   | 14                     | 4      | 7.000** | 1.890 | 25.932 |
| 3 signs                   | 21                     | 5      | 8.400*** | 2.539 | 27.789 |
| ≥4 signs                  | 36                     | 5      | 14.400*** | 4.496 | 46.125 |
| **Membership of women savings group** |                |        |    |
| Non-member                | 42                     | 30     | 2.177** | 1.103 | 4.297 |
| Member                    | 64                     | 21     |        |       |       |
| **Availability of primary health care facility nearby** |                |        |    |
| Unavailable               | 21                     | 3      | 0.253** | 0.072 | 0.892 |
| Available                 | 86                     | 48     |        |       |       |

Table II. Bivariate analysis of the relationship between the decision for choosing birthplace and selected independent variables

(continued)
Other factors that had a significant association in determining the choice of birthplace in the analysis included engaging in paid work within the last seven days of the survey (OR = 3.375, 95% CI = 1.593–7.150). This means that women that had a paid job in the last seven days before the survey were more than three times more likely to deliver in the health facility in comparison with women that did not work. Gestational age of the pregnancy was another significant determinant of the decision to use a facility for birth. Women in their 13–24 weeks of pregnancy (OR = 13.645, 95% CI = 1.758–105.893) and those above 25 weeks (OR = 6.065, 95% CI = 1.723–21.351) had higher odds of using the health facility during delivery. Pregnant women with knowledge of between one and more than four signs of a complication of pregnancy had higher odds of choosing to deliver in the facility as compared to those that did not know to recognize any signs of pregnancy complications.

Surprisingly, education, the decision on health care and time taken to reach the facility were all not found to be significantly associated with the plan to choose a birth center by the pregnant women involved in this study.

The result of the multivariate analysis was presented in Table III. Three variables out of those entered in the model were found to be significant determinants or predictors of choice of birthplace. These include religion, paid work in the last seven days and knowledge of at least one pregnancy complication. Pregnant women of Christian faith (AOR = 12.117, 95% CI = 1.774–82.741) had higher odds of choosing a health facility as their birth center than their Muslim counterparts. Pregnant women who engaged in paid work seven days before the survey (AOR = 3.633, 95% CI = 1.243–10.615) had four times higher odds of delivering in the health facility than pregnant women without paid work. In the same vein, the result found that the more knowledge a woman had of pregnancy complication, the higher her likelihood of delivering in the facility. Women who knew one sign of pregnancy-related complication (AOR = 4.284, 95% CI = 1.054–17.387) were four times more likely to deliver in the facility. Women with knowledge of more than four signs (AOR = 11.472, 95% CI = 2.001–65.768) had 11 times higher odds of delivery in the health facility as compared with ones without any knowledge.
The multivariate analysis did not find any association between age, marital status, education, history of pregnancy, gestational age, membership of women’s savings group, availability of health facility nearby, time to reach primary health care nearby and decision on health care as determinants of the choice of birthplace among the pregnant women.

Discussion
The result of the bivariate analysis found nine independent variables to be associated with the choice for birthplace by pregnant women in this study. Age, marital status, membership of the savings group, religion and gestational age were all significantly associated with the choice of health facility as a birthplace. Others included the availability of health facility nearby, paid work...
in the seven days preceding the survey, having previous pregnancies and knowledge of the signs of pregnancy complications was also significantly associated with the choice of birthplace. Women belonging to the savings groups had twice the odds of choosing a health facility as a birthplace compared to non-members. This could be explained by the access members of saving groups have for loans from their savings to pay all costs associated with delivery, which non-members did not have. Availability of a health facility within easy proximity was also found to be a significant factor in choosing to give birth in the health facility. In this study, women with an available health facility close to them were found to have lower odds of giving birth in a health facility compared to those without one near them. This finding contrasts with a similar study in Bangladesh where the proximity of a health facility near the household was found to be a predictor for its use by women experiencing uncomplicated pregnancies[13]. However, this is in agreement with the findings of Chowdhury et al[14] where the difference between institutional deliveries and home deliveries was based more on wealth than closeness to health services. The age of the pregnant women was found in some other studies to be associated with facility delivery. Older women may be more at risk of pregnancy complications than younger ones and, therefore, more likely to deliver in a facility on the advice of health workers[15].

Religion was also found to be a significant determinant of the place of delivery in this analysis. Christian pregnant women were found to have much higher odds of giving birth in a facility than their Muslim counterparts. This can be explained by the difference in beliefs and attitudes toward health care from women of these faiths. Other studies found the impact of religion, ethnicity and traditional beliefs to have large differences in determining the use of facilities for delivery while others found mixed results or no differences[16]. Some studies in Sub-Saharan countries found an association between traditional and Islamic practices and facility delivery. Some adherents of these beliefs in some countries were found to be less likely to deliver in a facility[17]. Religion remains a statistically significant determinant in the choice of place of delivery[18].

Paid work in the last seven days preceding the survey was found to be statistically significant in this study (OR = 3.375, p-value = 0.001). This may have to do with the issue of having some income to save for the purpose of delivery[10]. The gestational age of the pregnancy (OR = 3.223, p-value = 0.001) was also a significant factor in choosing a birth facility over home delivery. This study indicated that women with knowledge of at least one sign of the complications of pregnancy were found to be four times more likely to deliver in a health facility. This agrees with the findings of studies in Tanzania and Zimbabwe where women with previous pregnancy complications desired to choose a health facility for birth[19].

Women with a history of more than three previous pregnancies were found to be more likely to have their births delivered by skilled personnel in a health facility. The same applies to the knowledge of delivery practices. The lower the knowledge of a mother on safe delivery, the higher her odds of her delivery attended to by unskilled personnel outside the facility[20].

The non-significance of education and decision of women in utilizing health care was surprising considering the fact many studies found their significance in choosing a birthplace[13, 15, 16, 21]. The husband’s decision or preference was found to be a significant factor in deciding where pregnant women went for ANC or delivery[22].

The significant variables found to be influencing the choice of birthplace in the multivariate analysis in this study were religion, paid work and knowledge of at least one or more signs of pregnancy complications. Many studies found the association of these three factors (religion, women’s paid work and previous complications of pregnancy) with the choice of facility delivery. However, the association of membership of the savings group with the place of delivery, even though significant in the bivariate analysis, was not found in the literature in the context of Nigeria, making it an important topic for further research. Other studies in Asia, however, found membership of savings groups to be an innovative and promising way to improve utilization of maternal health services[23–25].
Although the education of the women was not found to be significant in deciding their choice of birthplace in this study, the influence of other languages (Hausa, Arabic) which the majority of the women could read and write in should not be neglected. Information and materials regarding maternal health should not be limited to English alone but need translation to these local languages for effective dissemination and mass mobilization.

With the recognition and knowledge of danger signs as predictors of the choice of facility delivery, we recommend that key maternal health messages with pregnancy complications be widely disseminated during ANC sessions and radio programs in the local languages.

We recommend further research on the impact of membership of women’s saving groups and other attitudinal characters of women to improve facility delivery thereby improving maternal health in the state.

This study had limitations, which need to be noted. It was difficult to confirm the pregnancy status of a woman in the first or second month of her pregnancy without a pregnancy test and so we relied on what they reported to us. Due to some cultural norms in the area, some women are shy to indicate they are pregnant to an outsider, especially if it was their first pregnancy.

Conclusion
Women in paid employment use their earnings to pay for maternal services easily. We recommend that the government enacts a policy that will support the establishment of women’s savings groups across the state, with a special emphasis on rural areas where costs and distances are barriers preventing women from giving birth in the facility. This will allow women to have an easy access to loans from their savings to pay for maternal and child health care.

Religious leaders have an active and vital role to play in improving facility delivery through sermons. Intensifying the dissemination of social mobilization messages on the dangers of pregnancy complications mostly associated with home births has the potential to increase facility-based delivery. These measures, when implemented, may improve facility-based births in the state as evident from the findings of this study.

References


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Abstract

Purpose – The purpose of this paper is to describe experiences of caregivers in managing psychotic symptoms of persons with schizophrenia in various circumstances.

Design/methodology/approach – The data were obtained via a focus group and in-depth interviews among caregivers who cared for relatives with schizophrenia for more than five years. Thematic analysis was used for data analysis.

Findings – “Making it better” emerged as the main theme describing caregivers’ experiences in trying to manage psychotic symptoms. It comprises four sub-themes including cutting off the wind, protecting from harm, preventing relapses and pulling back to normality. The caregivers gradually learned and adjusted their strategies through trial and error. They tried to stop aggressive and violent behaviors soon after they had begun by giving cool water to their relatives to drink or shower, while expressing their own affect with gently talking. They also dealt with a hardship in protecting the patients, other people, their properties and their own selves from harm resulting from violent behavior. When the psychotic symptoms improved, the caregivers tried to prevent relapses by using various strategies to maintain medication adherence and by soothing their relatives’ mental state. They also tried to pull their relatives back to normal as much as they could by promoting their relatives’ memories and abilities to perform daily functions.

Originality/value – The findings increase knowledge in nursing regarding psychotic symptoms management. The findings can be applied to the development of a program to help caregivers to manage psychotic symptoms effectively in order to promote good clinical outcomes of patients and alleviate the caregivers’ burden.

Keywords Schizophrenia, Psychotic symptoms management, Thai caregivers’ experiences

Paper type Research paper

Introduction

Schizophrenia is a severe and chronic disease. In Thailand, a report from the Department of Mental Health revealed that the numbers of hospitalized schizophrenia patients increased from 42,733 in 2013 to 44,556 and 46,837 in 2014 and 2015, respectively[1] which may reflect an increase in relapses of the disease. This may be the result of the policy of psychiatric hospitals to decrease the number of admissions and length of stay in the hospitals in order to enable patients to live in real-world circumstances. As a result,
in Thailand, the majority of schizophrenia patients (98 percent) returned home with some psychotic symptoms[2]. Therefore, caregiving became the responsibility of family members. Caregivers have to face difficulties in their caregiving role at home and yet have to promote continuous care, prevent relapse and improve the patients’ functioning. Because the patients’ psychotic symptoms remain, medication alone is not able to control all of the symptoms. Dealing with psychotic symptoms needs special skills. Moreover, most patients have poor compliance with medication, which adds more difficulties to the management and responsibility of the caregiver[3–6].

Many studies related to experiences of caring for persons with schizophrenia had mainly focused on the impacts of caring on the caregiver’s life. The findings showed that caring for patients caused poor physical and mental health conditions of the caregivers[7–9] and affected other functions and the family situation[10, 11]. Caregivers were stressed by the fluctuation of their relatives’ psychotic symptoms. They struggled to make the patients achieve normalcy by maintaining medication adherence, vigilant managing the symptoms, preventing any relapse of the symptoms and managing the consequences of being sick resulting in poor judgment, stigma, loss and other difficulties. In some cases, parents gradually accepted the untenable conditions which were a new normal for their children[6, 7].

The studies focused on the coping process[5, 12, 13] and developing caregiving skills[14, 15] explain that the coping behaviors of caregivers changed over time[14]. Caregiving skills were developed gradually and cumulatively via trial and error. The main tasks were parental caring, psychotic symptoms management and medication management[15]. Medication management was rated as the most difficult caregiving task[6, 16]. Caregivers used methods including checking, observation and warning patients about taking medications[14]. Moreover, they also used deceptive methods, forced patients to take medications and helped to alleviate the side effects of medications, which were a reason for not taking medications[6]. In psychotic symptoms management, caregivers made non-intrusive observations and used many methods, including direct observation, symptom inquiry and restraint when necessary to control the symptoms.

Although some studies shed light on psychotic symptoms management, little is known about the caregivers’ strategies in managing psychotic symptoms in various circumstances. Therefore, we were interested to study this issue in greater detail.

This study presented Thai caregivers’ experiences in managing psychotic symptoms of their relatives with schizophrenia. The purpose was to understand the meaning, situation, process, methods and results of psychotic symptoms management among caregivers in various circumstances.

Methods
This qualitative phenomenological study collected data by first using a focus group and also in-depth interviews, in order to enhance trustworthiness via the triangulation method. Participants included caregivers who had taken patients to the outpatient department of a hospital in Thailand. The study was approved by the ethics committee of Burapha University (IRB No. Sci 024/2560) and of the study site hospital (IRB No. BSH-IRB 012/2560).

Key informants
The participants were purposively selected for the focus group and the in-depth interviews using the same inclusion and exclusion criteria: being primary caregivers and living with patients; looking after patients who had been diagnosed with schizophrenia by a psychiatrist for at least five years; and being more than 18 years old and able to communicate in the Thai language. Caregivers who looked after other family members who were sick with other chronic diseases and caregivers who had a psychiatric illness themselves were excluded from the study.
Instruments

The interview guidelines contained open-ended questions to elicit the experiences in psychotic symptoms management in various circumstances. Sample questions included the following: “Could you please give me the meaning of psychotic symptoms management?” Or, “Could you describe your experience in managing your relative’s psychotic symptoms?” The researchers then used specific questions for more detail about each issue. For example: “how did you deal with (each psychotic symptom the caregivers mentioned)?” Or, “As you use such methods, what were the results?”

Procedure

To select the participants, the researchers asked for their interest in participating and informed them of the objectives, methodology, benefits and risks, and their rights as a participant prior to obtaining consent to participate in this study. The focus group took about 60 min and the in-depth interviews took about 70 min. The data were collected from July to August 2017.

Data analysis

The data were analyzed in the Thai language using Colaizzi’s method[17] by the following steps: read all protocols to acquire a feeling for them; review each protocol and extract significant statements; spell out the meaning of each significant statement and formulate meanings; organize the formulated meanings into clusters of themes; integrate results into an exhaustive description of the phenomenon under study; and the researchers used member-checking techniques to check the conclusion from the data with participants. The researcher then translated the findings into English, back-translated the findings using a bilingual editor and finally had it edited by a native speaker who works as an English instructor at a local university.

Results

Characteristics of the study participants

There were eight participants in the focus group, including three mothers, two daughters, one sister, one son and one father. Their ages ranged from 30 to 68 years with a mean of 50.9. The duration of their experience as caregivers was 9.75 years on average. All of them were Buddhist. Six of them finished elementary education and were married. Half were employees and seven of them earned an adequate income.

The patients’ ages ranged from 18 to 56 years with a mean of 40.8. All of them were male and single. Six of them were unemployed and were educated to elementary level. The frequencies of hospitalization were between one and six times.

The number of caregivers taking part in the in-depth interviews was 13 and most of them were female, including 6 mothers, 1 father, 5 elder sisters and 1 younger sister. Their ages were between 39 and 75 years with 58.07 years being the average. The duration of being caregivers was between 5 and 30 years with a mean of 14.46. Ten of them were Buddhists and the rest were Muslim. Eight of them were educated to elementary level and were married. Six of them had unstable occupations with an inadequate income.

The patients’ ages ranged from 25 to 60 years with a mean of 46. Nine of them were male, unemployed and single. Only one patient had never experienced a hospitalization, four patients had been hospitalized one to two times, five of them had been hospitalized three to six times and the rest had more than six hospitalizations.

The experiences of psychotic symptoms management for persons with schizophrenia.

“Making it better” emerged as the main theme describing an overview of the caregivers’ experiences in psychotic symptoms management for persons with schizophrenia. It also encompassed the meaning of psychotic symptoms management as perceived by all participants. Most caregivers perceived psychotic symptoms as aggressive and violent behaviors caused by brain problems. The aims of making it better were to improve the
situations, to prevent relapses or worsening of the symptoms which affected patients, other persons or belongings, and to give psychological support to prevent the exacerbation of aggressive behaviors, which could happen at any time. They also make an improvement in the patients’ daily functions. This involved a process of trial and error learning over a long time period and in many different circumstances. It comprised four sub-themes: cutting off the wind, protecting from harm, preventing relapses and pulling back to normality.

Cutting off the wind. This is an approach in dealing with initial signs of aggression such as irritability or a bad mood which might lead the patients to uncontrollable aggression. They tried to calm down the patients by giving them cold water to drink or advising them to take a bath. It was effective when the symptoms were minimal, as one caregiver said: “When I saw perspiration or a harsh stare, I told him to take a bath to make him cool down and feel refreshed, which was helpful sometimes.” In doing this, caregivers had to control their own mind even though they were full of stress, anger and frustration; as one caregiver stated in the focus group: “Use cold water to rub” (Thai proverb which means calming down anger). “When he is heated up we have to be water.”

In addition, caregivers used carefully modulated speaking to make them cease their unwanted behaviors. They would adjust their speaking tone according to the level of psychotic symptoms, which needed observation and understanding. They learned that criticizing, or blaming, would trigger the psychotic symptoms. When patients were aggressive, caregivers would talk with a soft and tender tone, supportive content and careful explanation and reasoning. It could improve their condition but also depended on the severity of the symptoms at that time. One mother explained:

I politely talked to him “Stop! It was wrong. You should not harm him. The police would arrest you if you did so”. He listened to me. “Who would I stay with? Did you know how much I love you?”

It seemed to calm him down if his conditions were not severe.

Moreover, caregivers also used silence in cases of uncontrolled aggression. They explained that talking at that moment was useless because the patient would not listen but would become more aggressive.

Protecting from harm. This was a method used to deal with the patients’ uncontrollable aggression or disorganization. Caregivers understood that the patients could not make good decisions, which might lead to injury. They used many strategies to protect the patients, others, their belongings and their own selves, including detaining, bringing back and letting go.

When the patients were chaotic and confused, the caregivers would first try to keep them at home to keep an eye on them. One caregiver said: “The first thing was to keep him at home. He goes away when he relapses. Retention to make him safe was the most difficult thing.”

Besides, if the patients were uncontrollable, such as running away from home or engaging in aggressive behaviors and frightening others, caregivers had to detain the patients in their room for the safety of the patients, others or their belongings. It would be the last strategy before taking the patients to a hospital. As a caregiver explained:

No one wanted to detain him. I did not want to do so but if he came out, the others could not accept it. He was aggressive. It was a small community near a mosque. The children would come to study religion in the evening after school. The children would not come because they were afraid of him. He had a harsh stare.

Some caregivers further explained that if the symptoms were severe, the patients would break windows or doors to get out. Caregivers had to make their room more secure by making a cement wall to close a room.

If the patients ran away from home, caregivers tried to bring them back home by seeking help from others such as rescue teams. They also used direct phone calls and would know the location to find them if the patients brought their mobile phone with them. It was not
effective if the patients did not receive the calls or their mobile phone batteries were dead, as a caregiver said: “Tried to call him at 3 a.m. The phone had no money or a charged battery, so I could not contact him. Could not do anything except keep waiting.”

Some caregivers prepared in advance, such as including contact lists of other relatives or putting coins in the wallet of the patient for them to call back via public telephones. However, these techniques were useless if the patients did not take their wallets with them.

When the patients had severe psychotic symptoms, caregivers would let things go for the safety of others and themselves even though their belongings were destroyed. Patients would finally calm down after acting out, as in the following example:

If he had severe symptoms, he would not stop. We had to let him do it. We knew that if he had severe symptoms, he would be chaotic and walk around. At the beginning, we tried to control him but the situation became worse, so we had to let go.

Preventing relapses. The strategies for preventing relapses consisted of continuing medications and psychological care.

Continuing medications
All caregivers were aware of the importance of drugs compliance. They later realized that the patient’s psychotic symptoms could relapse after they discontinued their medications. They tried to ensure medications adherence using various methods according to the severity of the symptoms. When the symptoms were still severe, the caregivers would closely monitor the patients taking medication because they knew that patients could not take care of themselves. The caregivers would give the medications on schedule by putting medication in boxes or bags according to the time of taking them and for the convenience of the patients when caregivers were away. However, caregivers also reminded the patients to take medication.

When a patient’s condition improved, the caregivers began to let the patient take medication by themselves, because they believed that the patients would be able to assume responsibility. In doing so, the caregivers reminded the patients to take their medication, or asked about taking medication, and emphasized the reasons for taking medication. As one caregiver said: “I would constantly warn him so that he would not forget. I told him that if he got sick again he would not recover.”

Additionally, if the patients underwent relapses, the caregivers would strictly check the medication or count the number of the pills, as one caregiver said:

I had to check. I looked at the medication packages to count the number of doses left and observed when he took medication. I looked in the medication bags when he was sleeping to confirm he was taking medications.

However, the caregivers had to deal with patients’ medication noncompliance for many reasons, such as believing that they were already well, not realizing the importance of continuing medication, avoiding the side effects of antipsychotics or not being aware of being sick. Caregivers faced difficulties in using various strategies to deal with this situation, including putting medication into liquids or putting it into food. However, this method did not always work if the patients noticed the changed taste of their food or drink. A caregiver said:

We developed various techniques. We put small pieces into jelly but he did not always eat it. We put it into what he liked to eat. Put it into curry but he did not eat all of it. Put it into rice which made the rice too wet so it was easy to notice. It was not working. If it was powder, it felt like gravel and he would never eat it at all.

Some caregivers used bartering techniques tempting the patient with what they liked such as giving them soft drinks or cigarettes if they complied with taking medications. If patients resisted, caregivers would threaten them with recounting the bad consequences of not
taking medications. They explained that they had to find reasons to threaten the patients as described below:

We told him that if he did not take medications he would have a headache and twisted mouth. If he wanted to stop taking his medication, he had to talk to the doctor. If he resisted, the doctors would send him to hospital. He was afraid, gave respect and asked us not to send him to the hospital.

Moreover, caregivers also tried to minimize the side effects of antipsychotic medications, which include constipation, drowsiness, muscle rigidity and tremors. Caregivers learned through experiences to observe, ask whether side effects had previously happened and attempted to minimize them. As a mother said: “I did not know it was a drug side effect until he told me. I bought laxatives if he was constipated. I had to look after everything.”

Psychological care
This was a method to support patients psychologically such as preventing stress in order to prevent relapses. They made observations for learning, knowing and understanding the behaviors, thoughts, feelings, symptoms and needs of patients. Caregivers had to truly stay with their patients. Knowing and understanding helped caregivers to adjust their responses appropriately in different circumstances, as in this caregiver’s elaboration: “I tried to observe him. I could ask him when he looked unwell, or when he was upset by someone talking. I had to monitor this otherwise the symptoms would return.”

Most caregivers explained that patients were easily stressed and irritable especially when they were hungry. Therefore, they tried to avoid making them feel stress by not opposing, not complaining, not blaming, giving morale boosters and not letting them get hungry. When the patients performed inappropriate behaviors, the caregivers would let them act out if those behaviors were not harmful. A caregiver said: “Prevent whatever made him stressed or in a bad mood, for example, I would prevent whatever made him stressed. I would not oppose him if he did not cause any damage.”

Pulling back to normality. The caregivers noticed that though psychotic symptoms were improved, the patient’s daily functions had declined. They were slower, inert and poor in performing daily routines. Most of the caregivers tried to help their patients to care for themselves, minimize their burden to others and normalize the patients’ functions as much as possible. They tried to improve memory and daily routine performance. In doing so, caregivers tried talking with patients or encouraged them to do various stimulating mental activities because they believed that something was wrong with the patients’ brain. One caregiver said: “I thought that if he had activities to do, his brain would be improved.”

Additionally, more than half of the caregivers tried to improve the patients’ responsibility for daily living by warning them regularly. When caregivers were not at home, they phoned to remind their patients to do their daily activities. If telling them what to do was not enough, they had to teach their ill relatives how to perform these tasks themselves. For example, they had to help the patient to take a bath properly or to shave their mustache neatly. After telling them, they observed whether the patients did it or not. One caregiver said: “I had to listen when he took a bath to make sure that he really did it. (The patient’s name), did you wash with soap or not? I sometimes had to teach him as if he was a child.”

Discussion
This study has offered some understanding of caregivers’ experiences in managing psychotic symptoms of their relatives with schizophrenia. The findings shared some common attributes with “struggling to restore normalcy” in a study among caregivers of persons with early schizophrenia[6]. The caregivers tried to use a variety of techniques to alleviate psychotic symptoms. They developed their strategies through trial and error,
learning in a long duration of caregiving experience. Each strategy depended on the severity of their relatives’ psychotic symptoms.

Unlike the findings of a study focused on caregiving in the early phase of schizophrenia[6], the informants of this study felt stability in caring for their ill relatives. This is in line with many studies focused on long-term caregiving[7, 14, 18–20] which indicate that the experience taught the caregiver how to overcome troublesome situations[6, 7, 14–16, 18–20]. They began to be familiar with or aware of the chronic trajectory through the cycle of exacerbations and relapses[18, 20]. They tried their best in caregiving to make it better and to maintain balance in their lives while gradually developing caregiving skills and strategies for various circumstances through experiential learning[6, 7].

In managing psychotic symptoms, most caregivers were concerned with aggressive behaviors that they portrayed as themes, such as cutting off the wind and protecting from harm. It is consistent with previous studies which indicated that safety concerns were most commonly mentioned in association with symptoms of agitation, irritability or hostility[6, 7, 19, 21]. This suggests that persons with schizophrenia are more likely to engage in aggressive or violent behaviors than those without such conditions. Besides, prior studies regarding caregivers’ perceptions of mental illness showed that caregivers described the person with mental illness as a violent person who needed to be controlled[22–26].

In protecting from harm, the caregivers focused on the safety of the patients, property, others and their own selves. They tried to make it better by using a complicit approach to calm down the patients and to prevent the escalation of aggression (cutting off the wind). This is consistent with previous studies[6, 7, 12, 19, 21, 26] which showed that caregivers had to be modest and humble when talking to the patients in order to handle agitated behaviors. They had to watch them carefully or follow them everywhere[6, 12]. This approach was effective if the patients were in an irritable or bad mood that needed early attention. The previous study also showed that early intervention in terms of environmental and behavioral approaches is important in calming aggressive patients[21].

However, the informants of the current study had no concerns about managing delusion or hallucination, which was noted as a cause of patients’ acting out[22]. The social media information on the nature of mental illness nowadays, which places emphasis on aggressive and violent behavior, could create misunderstanding among people. Caregivers additionally had little knowledge regarding psychotic symptoms, especially the warning signs of relapses. They discussed their experience mainly in terms of managing aggressive behaviors. Therefore, the concerns about safety came along with the concerns about preventing relapses, focusing on aggressive or violent behaviors. They tried to prevent relapses by maintaining medication adherence while preventing stressors, which is in line with previous studies[6, 7]. The caregivers used various approaches to maintain medication adherence and to comfort the mind of their relatives with schizophrenia in order to control psychotic symptoms[6].

In addition, the caregivers tried to pull their relatives back to normality, which shed light on psychiatric rehabilitation. Unfortunately, they focused only on daily routines and memory, which relied on their perception that a brain problem is a cause of mental illness. The evidence suggests that the benefits of other approaches of psycho-social or psychiatric rehabilitation, such as improving their housing, providing adequate education and a meaningful work career, satisfying social and intimate relationships and participation in community life with full rights, should be related to caregivers. A prior study showed that medication alone did not solve all problems; psycho-social support and rehabilitation were also needed. An individual’s recovery could benefit the whole community, particularly if they could return to work[27].

Conclusion
Our study contributes to psychiatric nursing practice in that it offers a new understanding how caregivers manage psychotic symptoms. It is evident that the caregivers experienced
difficulties in managing the patients’ psychotic symptoms. Aggressive and violent behaviors are viewed as a major concern among caregivers. In addition, there is also some concern regarding the warning signs of psychotic symptoms and psychiatric rehabilitation. Thus, a program to develop and enhance caregivers’ skills and competencies in managing psychotic symptoms should be developed in order to promote clinical outcomes of persons with schizophrenia and to decrease caregivers’ burden.

**Strengths and limitations**

This study obtained data from both focus group and individual in-depth interviews to confirm reliability by the method of triangulation, which is trustworthy. However, there were two limitations. First, since the research project had a time frame limitation of only one year, we could not make a further deep exploration of caregivers’ experiences, though we encountered some important points regarding managing delusion and hallucination. Second, although the study carefully recruited caregivers to increase the diversity of relationships between the caregivers and the patients, there were a limited number of male caregivers (two in the focus group and one in the in-depth interviews). As such, gender-specific caregiving experiences, in terms of the style of managing psychotic symptoms, need to be further explored. Recruiting a larger number of male caregivers would enhance the variety of experiences recorded.

**References**


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Efficacy of Brief Lifestyle Change in conjunction with Dental Care (Brief-LCDC) Programs on glycemic and periodontal status among DM patients

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Abstract
Purpose – A global trend of type 2 diabetes prevalence is rising. Preventing and managing of systemic and dental complications is crucial to decrease negative effects on glycemic control. The purpose of this paper is to estimate the efficacy of Brief Lifestyle Change in conjunction with Dental Care (Brief-LCDC) Programs to decrease glycemic level and improve periodontal status in patients with type 2 diabetes.

Design/methodology/approach – Health Center 54 conducted randomized controlled trial among 192 patients (96 intervention and 96 control) from February to August 2018. Group education for lifestyle modification, individual oral hygiene instruction and lifestyle counseling by motivational interviewing was provided to the intervention group at baseline. Motivation of lifestyle modification every month by multimedia was also provided to the intervention group. The usual program was provided to the control group. At baseline and a six-month follow-up, glycemic level and periodontal status were assessed from participants. Data were analyzed by descriptive statistic, t-test, χ² test, Fisher’s exact test, Repeated measure ANOVA and multiple linear regression.

Findings – Glycemic level and periodontal status were lower in the intervention group than the control group at the sixth-month followed up with statistical significances. Glycemic level and periodontal status had negatively correlated to intervention group with statistically significant.

Originality/value – Brief-LCDC Program which incorporated lifestyle modification and oral health care had efficacious to decrease glycemic level and improve periodontal status in patients with type 2 diabetes. Early prevention program by Brief-LCDC Program is crucial to prevent dental complications.

Keywords Type 2 diabetes, Glycemic level, Lifestyle modification, Oral health care, Periodontal status

Paper type Research paper
Macrovascular and microvascular complications are types of diabetes complications[1]. A macrovascular complication is a cardiovascular disease which causes stroke, heart attack and decreased blood flow to the legs[1]. Microvascular complications include retinopathy that causes deterioration to the eyes, nephropathy which deteriorates the kidney, neuropathy which deteriorates the nerves, delays in wound healing and also periodontal disease which deteriorates the gingiva[1].

Periodontal disease is the infection of the structure around the teeth involving the periodontium. Systemic inflammation from periodontal disease is one of the complications of type 2 diabetes[1]. The bidirectional negative effects come from both DM and periodontal disease[1, 5]. Uncontrolled diabetes (HbA1c ≥ 7 percent) influences the periodontal status and inflammatory cytokine from periodontal disease also influences glycemic levels[1]. The seventh Thai National Oral Health Survey in 2012 found that 85.9, 89.0 and 91.8 percent of the population aged 35–55 years, 60–74 years and above 80 years, respectively, had periodontal diseases[6].

In 2018, the Health Department of the Bangkok Metropolitan Administration found 25.0 percent of the Bangkok population was at risk of developing DM. Furthermore, only 47.0 percent of registered diabetic patients from 68 health centers under the Health Department had records of controlled glycemic levels (HbA1c < 7 percent)[7].

Earlier screenings for prevention of diabetes complications have included eye examinations, blood testing, foot screening, kidney examination, lipid profile testing, screening of cardiovascular risk and oral health examinations[7]. Management of type 2 diabetes was proposed by The American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD) who recommended a patient-centered approach[8]. Furthermore, it was advised that lifestyle modification and combination therapy should be accomplished by patient-centered diabetes management[8]. Lifestyle modification is a change of long-term habits, such as eating or physical activity, and maintaining new behavior patterns for months or years and can be used to treat a range of diseases, including DM[1]. Motivational interviewing (MI) guides patients to investigate and deal with their reservations and uncertainties through goal-oriented, patient-centered counseling to encourage behavior modification[9]. MI is useful for health-related behaviors, such as diet and exercise, medication compliance, substance abuse and periodontal health[9, 10].

At present, diabetic complications are prevented and controlled by programs or interventions for lifestyle modification consisting of nursing-related lifestyle modification[11], lifestyle modification by dietary counseling and exercise[12], and increased self-care behavior and medication compliance[13]. Oral complications (periodontal disease) have been prevented and improved by periodontal programs or interventions consisting of oral hygiene instruction and periodontal treatment[14–18]. However, lifestyle modifications or periodontal programs alone are not always sufficient to avoid oral complications because of the bidirectional negative effects of periodontal disease and glycemic levels[5].

Another method is the incorporated approach to chronic disease prevention to overcome the social inequalities of patients[19]. In this context, DM and periodontal disease prevention are incorporated by modifying risk factors which affect both DM and periodontal disease. For example, the lifestyle change plus a dental care (LCDC) program, which combined lifestyle modification and oral health care intervention by using the common risk factor approach and MI was applied to aging DM patients. After the LCDC program, the elderly patients had better knowledge, attitude, and decreased blood sugar levels, and an improved periodontal status[20, 21]. However, the LCDC program was only applied to aging DM patients and was time-consuming (20 min of MI per visit) and required increased health personnel to deal with the rise in DM patients. However, due to the increasing prevalence of DM amongst a younger age group (30–44 years)[4] and the increasingly prevalent progression of periodontal disease from DM[15, 16], the prevention
programs for aging DM patients might be too little too late to avoid oral complications, and a similar program to support and reduce the exacerbation of the problem from an earlier age was deemed advisable. Therefore, incorporating the brief lifestyle modification and oral health care program for every age group by the common risk factor approach and MI are considered essential to prevent oral complications. The Brief Lifestyle Change in conjunction with Dental Care (Brief-LCDC) Program is one such program that can be applied to all age groups.

The elderly have the benefit of their experience which supports their ability to learn from this program[22]. Therefore, the Brief-LCDC Program adjusted the contents of the LCDC program due to the different learning abilities between aging and non-aging patients. Group education combines a variety of age groups who benefited from shared and varied experiences between ages. Furthermore, individual lifestyle counseling that emphasizes differentiated instruction based on individual differences focus on the patient’s ability, interest and readiness had responded to the different learning ability between aging and non-aging patients[23]. Additionally, a combined age-group Brief-LCDC Program could save motivational instruction from 20 min (on the LCDC program) to 10 min for MI per visit. Also, when patients learn more about their levels of ability, interest, and readiness, the frequency of MI could be decreased from every three months (LCDC program) to every six months.

The present study estimated the efficacy of the Brief-LCDC Program to decrease the glycemic levels and improve the periodontal status of patients, as well as estimated the correlation between the Brief-LCDC Program and the glycemic level and the periodontal status in patients with type 2 diabetes.

Methods
This research was conducted in Health Center 54 located in Bangkok, Thailand, and included a double-blind randomized controlled trial from February to August 2018. Patients diagnosed with type 2 diabetes including HbA1c ≥ 7 percent[24], and who had at least 16 natural teeth (appropriate for examining plaque index (PI) and gingival index (GI)) were included in the study. Patients who had severe systemic diseases or complications, including hematologic disease, liver disease, and kidney disease, severe chronic periodontitis, or who could not communicate or speak the Thai language, or patients who did not agree to participate were excluded. The study protocol was approved by the Bangkok Metropolitan Administration Ethics Committee for Human Research (S001h/61). All participants signed informed consent forms before data collection. The sample size was calculated from a previous study[20] and included 87 participants in each group by achieving 80 power at a 5 percent significant level. The Clinical Attachment loss (CAL) of intervention and control groups were 2.97 and 3.44 (effect size: 0.47), respectively, and the pooled variance was 1.23[20]. The entire sample size was increased to 192 participants (96 per group) due to the 10 percent increase for attrition and refusal.

The DM clinic in Health Center 54 is held on Tuesdays and Thursdays. The research team randomly assigned the Tuesday clinic for the intervention and the Thursday clinic for the control groups. A total of 96 participants in each group were selected by the research team using systematic sampling techniques. The selected number was from the number of total patients in the DM clinic divided by the calculated sample size. A total of 14 participants were excluded; 6 from the intervention group because 1 participant had a kidney disease, 2 participants had severe chronic periodontitis and 3 participants did not agree to participate, and 8 from the control group because 2 participants had severe chronic periodontitis, 1 participant had kidney disease and the other 5 participants did not agree to participate. Therefore, at baseline, 192 participants (96 per group) finally participated in the present study.
Training of interviewers

The interviewers were trained up to the required standard by attending a day-long meeting. Training in MI for lifestyle modification and oral health care was provided. Instructional media and teaching techniques were also provided by experts in diabetes, dentistry and education to the nurse and dental assistant during a day-long training session. The teaching techniques were adjusted from the LCDC program because the Brief-LCDC Program can be adapted to every age group. Group education concentrated on sharing experiences between elderly and younger patients. Individual lifestyle counseling concentrated on differentiated instruction.

Intervention

The Brief Lifestyle Change plus Dental Care (Brief-LCDC) Program is adapted from the LCDC program[20, 21] and is based on a health belief model, social cognitive theory and cognitive-behavioral theory. The Brief-LCDC Program also uses the common risk factor approach[19] that incorporates the prevention and management of DM and periodontal disease through lifestyle modification and oral health care by inter-professional collaboration from physicians, nurses, dentists, and dental assistants and individual lifestyle counseling by MI. The contents of the Brief-LCDC Program were adjusted from the LCDC program in content and teaching techniques to make it appropriate for all age groups. The Brief-LCDC Program was decreased from 20 min (as in the LCDC program) to 10 min for MI per visit due to the age of participants and also decreased in the frequency of MI visits from three months to every six months.

In order to develop the necessary instructional media for group education and multimedia for the motivation of lifestyle modification and oral health care, a focus group discussion was held by collecting ideas from a physician, a nurse, a dentist, a dental assistant and a representative of a patient with type 2 diabetes. Three experts in education, diabetes and dentistry validated the instructional media and multimedia. The focus group discussion group also pretested the instructional media and multimedia and three focus groups, each with six type 2 diabetic patients who received service in Health Center 42 were also pretested.

A nurse with prior teaching experience provided a 20-min multimedia session for all participants on group education for lifestyle modification and oral health at baseline. The contents of the group education for lifestyle modification consisted of etiology, signs and symptoms, complications of diabetes, the prevention and management of diabetes complications, the association between type 2 diabetes and oral complications, and oral health care. The same nurse, who provided group education and was already trained in MI, also provided patient-centered individual lifestyle counseling, which was consistent with the contents of the group education using MI. Afterwards, participants chose a goal for their lifestyle modification and their oral health care. The goals covered the topics of dietary modification, exercise, self-care behavior, emotional and dental care. A dental assistant who was already trained in oral health education provided individual oral hygiene instruction for tooth brushing techniques, which emphasized flossing techniques and the use of a proxa brush to prevent periodontal disease. Individual lifestyle counseling by MI and individual oral hygiene instruction were repeated after six months. Additionally, booster sessions to promote lifestyle modification and oral health care were provided to the participants every month via a multimedia platform. Moreover, the physician and nurse revised each patient’s goals for lifestyle modification and oral health care every month.

Control group

The regular health center program consisted of visiting the physician every month, receiving group education for diabetes from a nurse, pharmacist, and dental personnel, checking fasting plasma glucose (FPG) and receiving diabetic medicine.
Outcome measures
Face-to-face interviews by questionnaire, blood sample testing and dental examinations were performed in both groups at baseline and at the six-month follow-up using the double-blind technique.

Dental examination
The dentist examined a full-mouth PI[25] and the GI[25] including four sites (buccal, lingual, mesial and distal). Probing depth (PD)[25] and gingival recession[25] were also examined on all maxillary and mandibular teeth. All dental examinations were performed by the standard manual periodontal probe (PCPUNC 15; Hu-Fridy®, Chicago, IL, USA). CAL was calculated from the PD plus gingival recession[25]. Two consecutive examinations of 20 participants (24 h apart) were performed before beginning the study to get the intra-examiner reliability. Two dentists including one periodontal expert examined the periodontal status of five patients with type 2 diabetes to obtain inter-examiner reliability. The Cohen’s κ was 0.85.

Blood sample testing; nurses collected the venous blood samples. FPG and Glycated hemoglobin (HbA1c) was assayed by using the glucose oxidase method and immunoassay method respectively at the Bangkok Metropolitan Administration laboratory.

A questionnaire was used to find baseline characteristics of the participants including gender, age, educational level, body mass index, health insurance, duration of diabetes and smoking status.

Statistical analyses
In order to compare baseline differences between groups, a descriptive statistic, t-test, χ² test and Fisher’s exact test were undertaken. Repeated measure ANOVA was tested for the change in outcomes across time. The differences in outcome changes were assessed by time-by-group interaction effects. The outcome measures of group differences between times were tested using the Post hoc test (Bonferroni). Multiple linear regression measured the correlation of the intervention. The stepwise method was used to incorporate variables in the regression models. Data were analyzed by SPSS statistical package version 16.0. All analysis used a 95% confidence interval, and a statistically significant p-value of less than 0.05.

Results
Study population
Of the 558 patients in the DM Clinic, 177 patients did not meet the inclusion criteria. In total, 381 patients were randomly selected to participate. Of the 192 participants included at baseline (96 intervention and 96 control), 186 (96.8 percent) (93 intervention and 93 control) were eligible for the six-month follow-up. Of the participants in the intervention group, one participant was admitted into the hospital and two participants changed their settlement area. For the control group, two participants changed their health insurance and one participant changed their settlement area (Figure 1).

Baseline characteristics
Among the 186 participants (93 per group), the majority were female. The age of the intervention and control group participants ranged from 30 to 84 and 33 to 80 years, respectively. All baseline characteristics did not have statistically significant differences between the intervention and the control groups (Table I).
381 Diabetic patients

177 did not meet the inclusion criteria

558 Diabetic patients

Figure 1.
Study flowchart

Variables | Intervention group ($n = 93$) (%) | Control group ($n = 93$) (%) | $p$-value
--- | --- | --- | ---
Gender
Male | 25 (26.9) | 37 (39.8) | 0.068a
Female | 68 (73.1) | 56 (60.2) |
Age
Mean ± SD | 61.35 ± 10.17 | 63.47 ± 8.99 | 0.008f
Min–max | 30–84 | 33–80 |
Educational level
Illiterate | 5 (5.4) | 5 (5.4) | 0.228b
Primary school | 56 (60.2) | 65 (69.9) |
Secondary school | 16 (17.2) | 17 (18.3) |
Vocational school | 7 (7.5) | 2 (2.1) |
Bachelor degree | 9 (9.7) | 4 (4.3) |
BMI ($\text{kg/m}^2$)
Mean ± SD | 27.19 ± 4.84 | 26.54 ± 5.15 | 0.899f
Min–max | 18.20–41.80 | 15.90–47.80 |
Health insurance
Universal coverage | 80 (86.0) | 83 (89.2) | 0.195b
Universal coverage (other) | 2 (2.1) | 5 (5.4) |
Government/state enterprise officer | 7 (7.5) | 4 (4.3) |
No | 4 (4.4) | 1 (1.1) |
Duration of being diabetes (years)
Mean ± SD | 9.78 ± 7.56 | 8.43 ± 5.96 | 0.087c
Min–max | 1–40 | 1–33 |
Smoking
Never | 85 (91.4) | 82 (88.2) | 0.798b
Ever | 3 (3.2) | 4 (4.3) |
Current smoker | 5 (5.4) | 7 (7.5) |

Table I. Baseline characteristics

Notes: $n = 186$. $p$ by $\chi^2$ test; bFisher’s exact test; c$t$-test. *Statistically significant at $p < 0.05$
Glycemic levels
The mean of FPG in the intervention group at baseline and the six-month follow-up were 131.81 ± 29.95 and 132.24 ± 28.19 mg/dL, respectively. The mean of FPG in the control group at baseline and the six-month follow-up were 129.34 ± 25.30 and 136.04 ± 25.29 mg/dL, respectively. The mean of HbA1c in the intervention group at baseline and the six-month follow-up were 8.27 ± 7.47 and 6.91 ± 6.11 percent, respectively. The mean of HbA1c in the control group at baseline and the six-month follow-up were 7.35 ± 7.17 and 7.61 ± 1.27 percent, respectively.

FPG and HbA1c were significantly lower in the intervention group when compared to the control group (p < 0.001 and < 0.001, respectively). Within groups at the six-month follow-up, the mean difference of HbA1c between the intervention and the control groups had a statistically significant difference (p < 0.001), whereas the mean difference of FPG between the intervention and the control groups did not have a statistically significant difference (p = 0.334) (Table IV). This suggests that HbA1c changed over time depending on the group (Table II).

Periodontal status
PI, GI, PD and CAL were significantly lower in the intervention group when compared to the control group (p < 0.001, < 0.001, < 0.001 and < 0.001, respectively). Within groups, the difference between baseline and the sixth-month levels of PI, GI, PD and CAL found statistically significant differences in both time and the interaction effect between intervention and time (Table III). At the six-month follow-up, the mean difference of PI, GI, PD and CAL between the intervention and the control groups had statistically significant differences (p < 0.001, < 0.001, 0.006 and 0.021, respectively) (Table IV). This indicates that the index for periodontal status changed over time and depended on the group.

Multiple linear regression analysis
At the six-month follow-up, the glycemic level and periodontal status were negatively correlated to the intervention group with statistical significance. FPG was significantly

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<th>MS</th>
<th>F</th>
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<td>(Between group error)</td>
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<td>Between subjects</td>
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<td>21,134.773</td>
<td>1.355</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Within group (error)</td>
<td>2,869.131</td>
<td>15.593</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Between group error)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
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<td>1</td>
<td>28.270</td>
<td>2.016</td>
<td>0.157</td>
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<tr>
<td>Intervention × Time</td>
<td>60.282</td>
<td>184</td>
<td>60.282</td>
<td>4.298</td>
<td>0.040*</td>
</tr>
<tr>
<td>Intervention × Within group (error) (within subject error)</td>
<td>2,580.529</td>
<td>14.025</td>
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<td></td>
</tr>
</tbody>
</table>

Notes: n = 186. *Statistically significant at p < 0.05

Table II. Repeated measure ANOVA of FPG and HbA1c
correlated to group affiliation, age, and FPG at baseline ($R^2 = 0.276, p < 0.001$). HbA1c was also significantly correlated to group affiliation and HbA1c at baseline ($R^2 = 0.612, p < 0.001$) (Table V). The PI was significantly correlated to group affiliation, PI at baseline and CAL at baseline ($R^2 = 0.428, p < 0.001$). The GI was significantly correlated to group affiliation, GI at baseline and CAL at baseline ($R^2 = 0.478, p < 0.001$). PD was significantly correlated to group affiliation, PD at baseline and CAL at baseline ($R^2 = 0.378, p < 0.001$). CAL was significantly correlated to group affiliation, PD at baseline and CAL at baseline ($R^2 = 0.652, p < 0.001$) (Table VI).

### Discussion

The Brief-LCDC Program that incorporated lifestyle modification and oral health care was found to successfully decrease glycemic levels and improve the oral health status of patients with type 2 diabetes as shown at the six-month follow-up.

In order to avoid oral complications, incorporated lifestyle modification and oral health care programs for every age group are essential. An analysis of multiple linear regression found that the Brief-LCDC Program was negatively correlated to glycemic levels (FPG and HbA1c)}
and periodontal status (PI, GI, PD and CAL). The Brief-LCDC Program significantly decreased glycemic levels and improved periodontal status when compared to the usual program. Consistent with the LCDC Program which combined lifestyle modification and oral health care by using a common risk factor approach, including individual lifestyle counseling by MI every three months successfully decreased glycemic levels and improved the periodontal status in aging DM patients[20]. A common risk factor approach and a patient-centered approach by MI on the Brief-LCDC Program decreased glycemic levels and improved periodontal status, which was the same as the guideline from the ADA and EASD[8]. The present study found that decreasing the frequency of MI from three months (LCDC Program)[20] and 1 month (face-to-face counseling)[26] to six months also decreased glycemic levels and improved periodontal status. However, during the follow-up period of the Brief-LCDC Program, glycemic levels were decreased with statistical significance for HbA1c alone. FPG measured a person’s blood sugar level after fasting for at least 8 hours, whereas HbA1c testing also examined hemoglobin levels[24]. The red blood cells had a half-life of about three months, so the HbA1c levels indicated blood sugar levels over this timeframe[24]. This indicates that the results of decreased HbA1c in the intervention group represented glycemic control behavior of patients for three months, which was better than the FPG.

Decreasing glycemic levels (FPG and HbA1c) following the Brief-LCDC Program were similar to previous studies which found a short-term reduction in FPG after a lifestyle modification program[27], improving blood sugar levels by monthly face-to-face counseling and self-care modification[26, 28], and improving blood sugar levels by an educational

<table>
<thead>
<tr>
<th>Variables</th>
<th>Time</th>
<th>Control (i)</th>
<th>Intervention (j)</th>
<th>Mean difference (i–j)</th>
<th>SE</th>
<th>p-value</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
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<tr>
<td>FPG</td>
<td>Baseline</td>
<td>93</td>
<td>93</td>
<td>−5.462</td>
<td>4.066</td>
<td>0.181</td>
<td>−13.484</td>
<td>2.560</td>
</tr>
<tr>
<td></td>
<td>6th month</td>
<td>93</td>
<td>93</td>
<td>3.806</td>
<td>3.927</td>
<td>0.334</td>
<td>−3.941</td>
<td>11.554</td>
</tr>
<tr>
<td>HbA1c</td>
<td>Baseline</td>
<td>93</td>
<td>93</td>
<td>−0.917</td>
<td>0.785</td>
<td>0.244</td>
<td>−2.465</td>
<td>0.631</td>
</tr>
<tr>
<td></td>
<td>6th month</td>
<td>93</td>
<td>93</td>
<td>0.694*</td>
<td>0.146</td>
<td>&lt;0.001*</td>
<td>0.405</td>
<td>0.982</td>
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<tr>
<td>PI</td>
<td>Baseline</td>
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<td>93</td>
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<td>0.080</td>
<td>0.154</td>
<td>−0.044</td>
<td>0.274</td>
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<tr>
<td></td>
<td>6th month</td>
<td>93</td>
<td>93</td>
<td>0.440*</td>
<td>0.083</td>
<td>&lt;0.001*</td>
<td>0.276</td>
<td>0.605</td>
</tr>
<tr>
<td>GI</td>
<td>Baseline</td>
<td>93</td>
<td>93</td>
<td>0.048</td>
<td>0.089</td>
<td>0.592</td>
<td>−0.128</td>
<td>0.224</td>
</tr>
<tr>
<td></td>
<td>6th month</td>
<td>93</td>
<td>93</td>
<td>0.418*</td>
<td>0.088</td>
<td>&lt;0.001*</td>
<td>0.243</td>
<td>0.592</td>
</tr>
<tr>
<td>PD</td>
<td>Baseline</td>
<td>93</td>
<td>93</td>
<td>0.117</td>
<td>0.134</td>
<td>0.384</td>
<td>−0.147</td>
<td>0.381</td>
</tr>
<tr>
<td></td>
<td>6th month</td>
<td>93</td>
<td>93</td>
<td>0.360*</td>
<td>0.130</td>
<td>0.006*</td>
<td>0.103</td>
<td>0.617</td>
</tr>
<tr>
<td>CAL</td>
<td>Baseline</td>
<td>93</td>
<td>93</td>
<td>0.181</td>
<td>0.252</td>
<td>0.473</td>
<td>−0.316</td>
<td>0.677</td>
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<tr>
<td></td>
<td>6th month</td>
<td>93</td>
<td>93</td>
<td>0.560*</td>
<td>0.241</td>
<td>0.021*</td>
<td>0.084</td>
<td>1.036</td>
</tr>
</tbody>
</table>

Notes: n=186. *Adjustment for multiple comparisons: Bonferroni. Based on estimated marginal means. *The mean difference is significant at the 0.05 level

Table IV.
Pairwise comparisons of the different measurements of the glycemic level and periodontal status in the intervention and the control groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>FPG (6th month)</th>
<th>HbA1c (6th month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group affiliation (ref. control)</td>
<td>−7.991 (3.448), 0.022</td>
<td>−0.349 (0.108), 0.001</td>
</tr>
<tr>
<td>Age</td>
<td>−0.390 (0.182), 0.034</td>
<td>0.741 (0.043), &lt;0.001</td>
</tr>
<tr>
<td>FPG at baseline</td>
<td>0.441 (0.057), &lt;0.001</td>
<td>0.473 (0.057), &lt;0.001</td>
</tr>
<tr>
<td>HbA1c at baseline</td>
<td>R² = 0.276, p &lt; 0.001</td>
<td>R² = 0.612, p &lt; 0.001</td>
</tr>
</tbody>
</table>

Note: n=186

Table V.
Multiple linear regression analysis for glycemic level (FPG and HbA1c)
<table>
<thead>
<tr>
<th>Variables</th>
<th>PI (6th month)</th>
<th>Parameter estimate (Standard error), p-value</th>
<th>Group affiliation (ref. control)</th>
<th>GI (6th month)</th>
<th>PD (6th month)</th>
<th>CAL (6th month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group affiliation</td>
<td>−0.371 (0.068), &lt; 0.001*</td>
<td>−0.377 (0.068), &lt; 0.001*</td>
<td>−0.294 (0.105), &lt; 0.001*</td>
<td>−0.445 (0.144), &lt; 0.001*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI at baseline</td>
<td>0.479 (0.067), &lt; 0.001*</td>
<td>0.355 (0.069), &lt; 0.001*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GI at baseline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD at baseline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAL at baseline</td>
<td>0.077 (0.021), &lt; 0.001*</td>
<td>0.131 (0.024), &lt; 0.001*</td>
<td>0.355 (0.110), &lt; 0.001*</td>
<td>−0.597 (0.151), &lt; 0.001*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$R^2 = 0.428, p &lt; 0.001^*$</td>
<td>$R^2 = 0.478, p &lt; 0.001^*$</td>
<td>$R^2 = 0.378, p &lt; 0.001^*$</td>
<td>$R^2 = 0.652, p &lt; 0.001^*$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: *Statistically significant at $p < 0.05$
program that reduced resistance to treatment[29]. However, another study found that a three-year program for self-management behavior and single education decreased HbA1c with no significant difference[13].

Improved periodontal status (PI, GI, PD and CAL) following the Brief-LCDC Program is consistent with results from previous studies[17, 18]. However, a previous study in Thailand found decreasing HbA1c without a significant difference after periodontal treatment[30]. The severity of periodontal disease influenced the control of HbA1c[31, 32]. Another study found that another means of preventing dental complications was the screening for periodontal disease as part of the multidisciplinary management of type 2 diabetes[33].

Introducing a double-blind technique and using biomarkers for assessing the glycemic level and periodontal status, as well as the high response rate (96.8 percent), are strengths of the present study. The selection bias, dependent on compliance and the limited 1-day training for interviewers are the limitations of this study. Future studies need to integrate a long-term follow-up period to assess the effects of intervention, compliance and feasibility over time. The Brief-LCDC Program could be introduced to diabetes clinics in Bangkok to prevent oral complications.

Conclusion
The Brief-LCDC program has the efficacy to successfully decrease glycemic levels (HbA1c and FPG) and improve the periodontal status (PI, GI, PD and CAL) of patients with type 2 diabetes, if maintained for six months.

References


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Application of social dance exercise and social support program to improve quality of life for Thai older adults

Kwanrutai Sampoon, Nuengruethai Posri and Boonsri Kittichotpanich
College of Nursing and Health, Suan Sunandha Rajabhat University, Bangkok, Thailand

Abstract

Purpose – The purpose of this paper is to test the effectiveness of social dance exercise and social support program to improve quality of life (QOL) for older adults in Thailand.

Design/methodology/approach – A quasi-experimental pre-test and post-test research design was used. The participants were 102 older adults selected by systematic sampling technique. Participants were assigned using the matched-pair technique by age, physical fitness test by the Time up and Go test into intervention and control groups of 51 subjects each. Intervention was conducted for 12 weeks, three times weekly, to improve physical, psychosocial and spiritual domains leading to enhanced QOL as measured by the World Health Organization Quality of Life (WHOQOL-BREF–THAI) assessment parameter. Data on QOL were collected before and after a 12-week training period.

Findings – Most adults were between 70 and 79 years old (67 percent). After program completion, before and after mean QOL scores for the intervention group at 60.15 and 95.82, respectively, were statistically significant with \( p \)-value < 0.05. Post-program QOL shown by the intervention group was significantly higher than the control group (\( p < 0.05 \)).

Originality/value – Application of social dance exercise and social support program is an alternative to traditional methods to improve QOL and maintain functional capacity for older adults.

Keywords Social support, Older adult, Quality of life, Thailand

Paper type Research paper

Introduction

Quality of life (QOL) among the older adult population is affected by many factors as multiple health disorders lead to diverse physical and mental disturbances. Nowadays, people aged 60 and older comprise 900m of the global population. This number is expected to reach nearly 2.1bn by 2050, with a threefold increase in those aged 80 years or over[1]. The Thai elderly adult population has increased sevenfold from 1.5m in 1960 to 10.7m, representing 16 percent of the total population in 2015. In 20 years’ time, projections indicate that the Thai elderly population will comprise 25 percent of the overall population[2]. Aging
is a biological process that occurs over time[3] and affects physical, emotional and social abilities. Demographic changes can increase the incidence rate of non-communicable diseases such as osteoporosis, diabetes, high blood pressure, heart disease and cancer[4]. Chronic non-communicable diseases were the leading cause of death in both high- and low-income countries at 70 percent in 2008[5]. High levels of many diseases lead to reduced physical performance, lower QOL and a higher risk of death[4,6]. Older adults are more likely to suffer from social and economic losses caused by retirement, social withdrawal and loss of social involvement[7]. Reduced physical activity leads to limited mobility, the need for help from others and cognitive impairment[8]. Chronic expenses are estimated at 75 percent of all health costs involving medical services, medical care, medical consultation, transportation, rehabilitation or long-term care[9].

Social dance exercises are particularly important for the elderly as they help to maintain bodily health and slow down degeneration through improved balance and gait with better coordination of various organs. Falling over represents a major public health challenge for the elderly, and exercises that improve balance are recognized as effective fall prevention strategies which lead to improved QOL[10, 11]. Poor balance is associated with an increased risk of falling, disability and death in older populations[12]. Social dance exercise improves physical health aspects by improving symptoms of fatigue and enhancing balance and gait and muscle tone. Psychological aspects include improved well-being which reduces stress, anxiety and psychological distress[13, 14]. Interestingly, older adults reported that they found dancing to be an attractive social activity because the activity made them feel playful and “re-live” happy experiences from their youth[15, 16]. Furthermore, social dance builds relationships between older adults through their partners, their friends and their families.

Social support is another important factor for older adults who are more likely to suffer from social isolation by living alone, low mood swings from increased health risks and reduced self-care ability to perform basic activities of daily living[17, 18] Additionally, older adults lack social support, while somatic health problems are associated with psychological distress. The combination of poor social support, poor somatic health and economic problems render the elderly vulnerable with respect to mental health[19]. Interventions which highlight social support are considered to be beneficial and promote mental health. Older adults need support from friends and family to overcome anxiety or loneliness and make them feel a productive part of society. In crisis situations, friends, family and social support must work together. Previous research suggested the benefits of various intervention packages based on the concept of social support to improve the QOL for the elderly[20, 21]. In Thai culture, sons and daughters often care for their parents and grandparents to show their gratitude. All the same, a strong social support system is key to promoting self-care behaviors which lead to improved QOL for older adults.

In this study, a social dance program was developed along with social support to motivate exercise amongst the Thai elderly based on social support concepts and the concept of QOL[22, 23]. Results were assessed to determine improvements in QOL. Previous investigations have not studied psychological and social relations among the elderly. Our findings can be used as key information for promoting healthcare behavior among the elderly, leading to a better QOL in the future.

Methods

Study design and participants

This quasi-experimental research used a pre-test and post-test design to evaluate how social dance exercise and social support impacted on the QOL for a sample of Thai older adults. Instruction was provided by an expert in social dance with classes lasting 45 min, three times weekly for three months. The sample size was determined by the statistical software package G*Power with an effective size = 0.50, (α) = 0.05, and (1−β) = 0.80. Systematic sampling was employed to select 102 subjects, and the matched-pair technique
was used to assign subjects into intervention and control groups of 51 subjects each. All participants were 60 years or older, under no physical activity restrictions imposed by their physicians and living in a local Thai community. Exclusion criteria were individuals with Alzheimer’s disease and other cognitive disorders who were unable to answer questions or respond during the interview process. All subjects were assessed before and after the training period. The study was conducted in a community of Bangkok Metropolitan Thailand from April to August 2018. Research approval was granted by the Ethics in Research Committee of the Suan Sunandha Rajabhat University Institutional Review Board (COA 1-058/2017).

**Application of the social dance support program**

Subjects voluntarily participated in a three-month social dance exercise and social support program with classes lasting 45 min three times a week for three months. In the first phase, one week before the commencement of the class, voluntary partners or primary caregivers of older adults who were willing to participate in this research were trained in the social support program. The social support program included training in emotional support, instrumental support, appraisal support and information on the methods used by the researcher team to support older adults during class that were to be continued in the participants’ homes. During the first week of the second phase, subjects received knowledge concerning the social dance exercise and the social support program such as emotional support, instrumental support, appraisal support and information support from their partner or primary caregiver and the researcher. The 2nd to 12th weeks involved practice in social dance exercise routines with social support from partners who volunteered to join the program since almost all the older adults were widows or widowers. Our research prevented bias using the matched-pair technique. The intervention program was conducted by experts in social dance exercise at a fitness center in the community. The social dance and social support program consisted of three sessions: Session 1, “warming up” lasting 10 min; Session 2 “practice” lasting 30 min and including Cha-cha-cha, Taloong and Paslop, with some repeated movements during the exercise; and Session 3 the “cool-down exercise” phase, lasted for 5 min. The same dance routine was followed in each class. The social support program was divided into two parts with the first part during the practice provided by partners or primary caregivers and the researcher. The second part was provided after each practice session by partners or primary caregivers to motivate the subjects to continue practising at home. The researcher monitored the intervention process by making telephone calls to subjects and their partners or primary caregivers after each class. There was an open time of 24 h for subjects to call the researcher if they had any problems.

**Research instruments**

Research instruments used in this study included demographic data, The Time up and Go (TUG) test and the modified World Health Organization Quality of Life (WHOQOL)–BREF–THAI that contained three domains with 25 items[23] for data collection.

**Data collection**

The researcher first contacted community leaders and requested permission to collect data from the participants. All subjects accepted the study objectives and were willing to participate. Before the intervention, demographic data were collected on self-reported age, level of education, number of illnesses, medication used, fall accident history and also results from the TUG test conducted by the researcher team. Investigators obtained and recorded baseline assessments of health mobility related to the QOL by the WHOQOL–BREF–THAI version. After the 12-week training period, the WHOQOL–BREF–THAI was used to collect follow-up data.
Data analysis
SPSS 24.0 for Windows was used to calculate all statistical analyses. Data normality was tested by mean and standard deviations. Assumption of normality for the outcome variables were confirmed ($p < 0.05$) and the independent $t$-test was used to determine the QOL for older adults between the intervention group and control group after completing the social dance exercise support program. A paired $t$-test for repeated measures was employed to compare the QOL pre- and post-test within the intervention group. The statistical significance level was set at $p < 0.05$.

Results
Demographic characteristics of subjects in both intervention and control groups showed that most were in the middle-old age group (70–79 years) constituting 67 percent. Females in the intervention group numbered 88 percent with 85 percent in the control group. Divorce status in the intervention group was 75 percent with 70 percent in the control group. For the intervention group, 52 percent had graduated at the primary education level and 45 percent were classified as having a low income. Non-communicable diseases such as hypertension among the control group was at 55.3 percent while the control group level was at 44.7 percent. Diabetes mellitus was at 48.4 percent with 51.6 percent in the control group, and cardiovascular disease at 52.2 percent with 47.8 percent in control group. Total QOL mean score of the intervention group post-test was 95.82, SD = 6.10, significantly higher than the pre-test mean score at 60.15, SD = 9.38 (Table I). Total QOL mean score post-test for the intervention group was 95.82, SD = 6.10, higher than the control group at 68.23, SD = 5.71 with statistical significance ($p < 0.05$) (Table II).

Discussion
Results determined that the intervention group had significantly higher mean scores after attending dance classes. Moreover, when comparing mean scores of QOL in the intervention and control groups, the former gave statistically significant higher results than the latter for all domains. Thus, the QOL for older adults can be enhanced by applying social dance exercises combined with social support programs. Research design activities were based on concepts of social support and QOL\cite{14, 24} as emotional support, valuation support, information support and resource support. Our results suggest that QOL for older adults can be improved by influences from all aspects of physical,

<table>
<thead>
<tr>
<th>Domain</th>
<th>Intervention group ($n = 51$)</th>
<th>Control group ($n = 51$)</th>
<th>$t$-test</th>
<th>$p$-value</th>
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<tbody>
<tr>
<td>Physical</td>
<td>Mean 42.15, SD 8.61</td>
<td>Mean 26.14, SD 7.56</td>
<td>4.34</td>
<td>0.025</td>
</tr>
<tr>
<td>Psychosocial</td>
<td>Mean 39.29, SD 4.49</td>
<td>Mean 24.57, SD 5.19</td>
<td>3.38</td>
<td>0.041</td>
</tr>
<tr>
<td>Spiritual</td>
<td>Mean 35.23, SD 5.41</td>
<td>Mean 23.48, SD 4.48</td>
<td>2.17</td>
<td>0.032</td>
</tr>
<tr>
<td>Total quality of life</td>
<td>Mean 95.82, SD 6.10</td>
<td>Mean 68.23, SD 5.71</td>
<td>5.85</td>
<td>0.038</td>
</tr>
</tbody>
</table>

Note: $n = 102$

<table>
<thead>
<tr>
<th>Domain</th>
<th>Mean</th>
<th>SD</th>
<th>$t$-test</th>
<th>$p$-value</th>
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</thead>
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<tr>
<td>Pre-test</td>
<td>60.15</td>
<td>9.38</td>
<td>0.026</td>
<td>0.038</td>
</tr>
<tr>
<td>Post-test</td>
<td>95.82</td>
<td>6.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $n = 102$

Table I. Pre-test and post-test quality of life scores for the intervention group

Table II. Post-test scores of quality of life between the intervention group and control group
psychosocial and spiritual domains. With regard to the physical domain, older adults were able to perform daily activities by themselves and their QOL was enhanced[25] as social dance exercise resulted in improved muscle strength[26]. Demographic factors were statistically significantly related to the enhanced QOL for older adults[13, 27]. Exercise can be linked to better social functioning and emotional well-being[14]. Evidence suggested that dance therapy significantly improved blood pressure, quality of sleep and QOL[19, 28]. The psychosocial domain means scores were also higher for the intervention group which can be explained by enhanced social relationships. Social support positively affected QOL for older adults when a family member or neighbor empowered them to exercise. Social support influenced older adults to follow better care behaviors and this resulted in improved QOL. Previous studies suggested that interventions such as regular walking or rehabilitation programs improved older adults’ perceptions of happiness[29]. The spiritual domain showed a significantly high value on the intervention group’s mean score. When older adults can look after themselves, family and partners, social support helps them to feel proud and this leads to a better QOL. Accordingly, dance intervention and social support increased overall health and well-being[20]. Social dance exercise and social support programs are easily accepted by older adults. They are feasible to implement and offer a way to ameliorate the physical and psychosocial risk factors involved in accidents or falling down for community-dwelling adults[15].

Conclusions
This applied social dance exercise and social support program presents an alternative to traditional methods, providing the elderly with improved physical, psychosocial and spiritual domains. Focus on functional-based exercises for interventions should be encouraged to maintain and improve the QOL for older adults. Our study has some limitations since we only used the WHOQOL-BREF–THAI test to measure the QOL. Future research could include extra variables such as functional status or social engagements for a more comprehensive understanding of the beneficial effects of a social dance exercise intervention program.

References


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