บทความวิจัย

ผลของโปรแกรมการปรับรูปแบบกิจกรรมที่ใช้แรงกายตามรายบุคคลต่อคุณภาพชีวิตในผู้ที่มีภาวะปอดอุดกั้นเรื้อรัง

EFFECTS OF THE INDIVIDUALIZED PHYSICAL ACTIVITY PROGRAM ON QUALITY OF LIFE AMONG PERSONS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Abstract

Physical activity has been suggested to promote functional capacity, prevent complication, and enhance activity in daily life among persons with Chronic Obstructive Pulmonary Disease (COPD). The Individualized Physical Activity (IPA) program was developed based on Evidence-Based Practice (EBP). This randomized controlled trial study aimed to examine the effects of IPA program on quality of life among persons with COPD. A sample of 74 COPD patients who lived in Phitsanulok province and met inclusion criteria was recruited, then randomly assigned into the IPA group (n=38) and the control group (n=36). The 6-week IPA program was implemented weekly to the experimental group, whereas the control group received the usual care. Both groups were measured using the Health Related Quality of Life Questionnaire (HRQOLQ) at baseline, 8th week, and 10th week. Descriptive statistics and Repeated Measures ANOVA were used to analyze data. There was significant difference between the IPA and the control group on quality of life ($p<.01$). Furthermore, there was significant difference on outcome over times ($p<.01$). The results also showed the significant differences of interaction effects between time and group of outcome ($p<.01$). Based on the findings, IPA program could be used to promote quality of life among COPD patients.

Keywords: individual physical activity, quality of life, Chronic Obstructive Pulmonary Disease

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บทคัดย่อ

การมีกิจกรรมทางกายอย่างเหมาะสมเป็นข้อแนะนำที่สำคัญสำหรับผู้ที่มีภาวะปอดอุดกั้นเรื้อรังในการส่งเสริมความสามารในการทำหน้าที่ การป้องกันภาวะแทรกซ้อน และเพิ่มความสามารถในการปฏิบัติกิจกรรมในชีวิตประจำวันได้ การวิจัยครั้งนี้เป็นการทดลองแบบสุ่มและมีกลุ่มควบคุมเพื่อศึกษาผลของโปรแกรมการปรับรูปแบบกิจกรรมที่ใช้แรงกายตามรายบุคคลต่อคุณภาพชีวิตในผู้ที่มีภาวะปอดอุดกั้นเรื้อรัง ซึ่งโปรแกรมพัฒนาขึ้นจากการใช้หลักฐานเชิงประจักษ์ กลุ่มตัวอย่างในการวิเคราะห์ที่มีคุณสมบัติตามที่กำหนดจำนวน 74 คน โดยอาศัยอยู่ในจังหวัดพิษณุโลก ประเทศไทย และมีการสุ่มเข้ากลุ่มทดลองและกลุ่มควบคุม กลุ่มทดลองจะได้รับการดูแลตามปกติและโปรแกรมการปรับรูปแบบกิจกรรมที่ใช้แรงกายจำนวน 6 สัปดาห์ ขณะที่กลุ่มควบคุมได้รับการดูแลตามปกติ ทั้ง 2 กลุ่มจะได้รับการประเมินด้วยแบบสอบถามคุณภาพชีวิต ก่อนการทดลอง และ สัปดาห์ที่ 8 และ 10 หลังการทดลอง วิเคราะห์ข้อมูลโดยใช้สถิติบรรยายและการวิเคราะห์ความแปรปรวนที่มีการวัดซ้ำ

ผลการทดลองพบว่ากลุ่มทดลองมีคุณภาพชีวิตที่สูงกว่ากลุ่มควบคุมและมีคุณภาพชีวิตที่แตกต่างกันในช่วงเวลาที่เปลี่ยนแปลงไปอย่างมีนัยสำคัญทางสถิติ จากผลการศึกษาสนับสนุนว่าโปรแกรมการปรับรูปแบบกิจกรรมที่ใช้แรงกายตามรายบุคคลจะเป็นประโยชน์ในการส่งเสริมคุณภาพชีวิตในผู้ที่มีภาวะปอดอุดกั้นเรื้อรังได้

คำสำคัญ: กิจกรรมที่ใช้แรงกายอย่างเหมาะสมตามรายบุคคล, คุณภาพชีวิต, โรคปอดอุดกั้นเรื้อรัง

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a progressive inflammatory pulmonary disease characterized by chronic obstruction in peripheral bronchus and pulmonary emphysema. The World Health Organization (WHO) estimates that 65 million people have COPD worldwide and more than 3 million people died of COPD in the year 2010. WHO (2013) expects that COPD will be the third leading cause of death worldwide in 2030. In Thailand, Health Statistics ranked COPD as the fifth leading cause of death with a mortality rate of 33.5 and an incidence rate of 403 per 100,000 populations (Pothirat, Phetsuk, Theerakittikul, & Liwsrisakun, 2007).

Most of COPD persons have the effects of detrimental extra-pulmonary. Respiratory and peripheral muscle dysfunction has significant consequences for COPD persons and presented decreasing activity effect on duration around 1 year (Gea, Agusti, & Roca, 2013; Troosters et al., 2013). These symptoms make physical activity as unpleasant experience, which many patients try to avoid, and along with a depressive mood status, further accelerates the process, and leading to an inactive life-style. Muscle de-conditioning associated with reducing physical activity and contributes to further inactivity. As a result, patients get trapped in a vicious cycle of declining physical activity levels (Jaussen, Spruit, Uszko-Lencer, Schols, & Wouters, 2011; Franssen & Rochester, 2014). Both respiratory and peripheral muscle dysfunction are associated with reduced exercise tolerance and reduced quality of life (QOL).

QOL is an important measurable outcome among COPD persons and is known to predict mortality, hospitalization and health care resource utilization. COPD is associated with physical, psychological, and social problems and poorer

quality of life. Multiple symptoms burden and impairment in activities of daily living are the common physical problems experienced by COPD persons (The Global Initiative for Chronic Obstructive Lung Disease, 2010). Previous studies have identified breathlessness and fatigue as the most troublesome symptoms, which affect the performance of daily activity levels and decrease the overall QOL. QOL is associated with breathlessness and physical impairment, and also reduced activities of daily living and psychological distress. Similarly, higher airflow limitation and higher dyspnea are associated with worse health-related QOL (Sams, 2010; Sharma & Joshi, 2015; Valenza et al., 2014).

Evidences showed that increasing appropriated physical activity in COPD persons can delay progression of disease, reduce rate of hospital readmissions and mortality, increase pulmonary capacity, and improve health-related quality of life (Fernadez et al., 2014; Nguyen et al., 2014). While, there are various physical activity or exercise programs for COPD persons, these programs always dominated by providers who set physical activity plan. However, no programs can be used by all COPD persons because same programs did not set specific information to patients context or levels of activity. Moreover, gradually increase physical activity will affect lung function and may result in acute exacerbation which can lead to respiratory failure (Monique, Akker & Hermie, 2014; Sorknaes et al., 2013; Waschki et al., 2012).

The Individualized Physical Activity (IPA) program is evidence-based intervention as designed program address individual characteristics of persons. IPA program for persons with COPD was intensive and interactive to support patients to monitor themselves and use patient-adjustable, decision making, design action plans for increasing daily physical activity. Besides improving patient illness perception and believes, IPA program have been shown to improve physical activity behavior and enhance the individual's QOL. The aim of this study was to determine the effects of the IPA program on quality of life among persons with mild to moderated COPD.

Research methodology

Study design and setting

This study was a randomized controlled trial. Recruitment was conducted at the outpatient department of Buddhachinaraj Hospital in Phisanulok province, Thailand.

Population

Population was Thai people with mild to moderated stage of COPD who lived in Phitsanulok province and followed up at the Buddhachinaraj hospital at the time of data collection. The FEV1/FVC<0.70, FEV1≥ 80% and FEV1/FVC<0.70, FEV1= 50-79% were used as criteria of mild to moderated stage of COPD (Global Initiative for Chronic Pulmonary Obstructive Lung Disease, 2010).

Sample

Inclusion criteria included 1) being diagnosed with mild to moderated stage of COPD at least 1 year, 2) age ≥ 20 years old, 3) able to read, write, and understand the Thai language, 4) no cognitive impairment when completing the Chula Mental Test ≥ 14, 5) no smoking or being smoking cessation at least 1 years, 6) do not have ischemic heart disease, congestive heart failure, and advanced lung carcinoma, 7) no home oxygen therapy use, and 8) be able to contact by telephone. Sample size was determined by power analysis based on similar customized intervention programs with effect size was 0.48 (Noar, Benac & Harrir, 2007), power was .80,

and α = .05. Attritional rate was compensated for previous of 20% (Verwey et al., 2014). Additional is 7 participants per group, then a total of 41 participants per group. Then, the total sample was 82 participants. The participants were randomly assigned to either the experimental group or the control group by using a sequentially numbered opaque sealed envelope. They selected sealed opaque envelopes containing group assignments. They did not know their group assignment until their first session.

Ethical considerations

This study was approval by the Research Ethics Committee of the Faculty of Nursing at Burapha University in Thailand, IRB approval number 02-07-2559 and Buddhachinaraj Phitsanulok Hospital, IRB approval number 095/59. Potential participants received an information sheet describing: the study purpose, involvement in research participation, assurance of confidentiality and anonymity issues, and ability to withdraw at any time without any consequences. Individuals who agreed to participate were asked to sign a consent form.

Instrumentation

Instruments were used for data collection included

1. Demographic questionnaire was developed by the researcher and used to assess the participants' personal, health, illness and socioeconomic data. It consists of questions about characteristics of participants including; age, gender, religion, marital status, education, occupation, family income, caregiver, smoking and alcohol drinking history, medical treatment, comorbidity, and history of acute exacerbation.

2. The health-related quality of life was measured by the Health-Related Quality of Life Questionnaire (HRQOLQ). HRQOLQ was a Thai version of Saint George's Respiratory Questionnaire (SGRQ) (Jones, 1991). HRQOLQ was translated by Naklamine et al. (2011), designed to measure impact of respiratory symptoms on overall health, daily life and perceived well- being. The questionnaire is divided into two sections. Section one includes frequency and severity of symptoms. Section two covers limited activities and impact on psychological and social functioning by breathlessness. Response items for the first section are the 5-point Likert scale but dichotomous variables (yes/no) are applied for the second section. For section one has Cronbach's alpha coefficient > 0.80 and section two has the Kuder-Richardson 20 coefficient > 0.70. Score range from 0 to 50, with a high score suggesting a lower quality of life.

Intervention

The Individualized Physical Activity (IPA) program consists three sessions: 1) individual assessment for finding defect session was finding individual core health beliefs, preference about COPD and identification perception of benefit and barrier on increasing physical activity 2) reconstruction core believes and misperception session including patients' motivation to change physical activity behavior and their confidence to actually perform by providing tailored physical activity information which specific for individual needs and problems, in addition suggest peer support and 3) Maintains activity session including providing the positive feedback as well as response to arising individualized barriers and needs.

Data collection for experimental group

The steps in conducting the study were present as follow:

Session 1 individual assessment for finding defect

Week 1: The researcher began building relationships around 5 minutes, individual assessment for knowing and understanding COPD person by assessment individual belief, needs, preference, experiences, characteristics, social support, context, and knowledge comprehension by using individual assessment form and open-ended questions.

Session 2 reconstruction core believes and misperception

Week 2: the researcher provided tailored physical activity information which specific for individual needs by using customized information modules which contained information about benefit and risk of physical activity among COPD persons, techniques to enhance physical activity in daily life, difference types and strategies of physical activity management. Participant would compare and examine weights between benefit and barriers for decision to attention beginning the PA behaviors, and the participant would share experience with peer support for increasing confidence and self-efficacy simultaneously.

Week 3: the researcher supported the participants to construct stepwise goal setting by choosing the practical activity in daily life. The participants would record activity and plan for the step up of activity in self-reported physical activity level record form. All together, the researcher enhanced the data about social support and participated with family for support activity. In addition, the researcher would support decision making, planning activity, and increasing self-confidence.

Session 3 maintains activity fidelity

Week 4 and 6: the researcher maintained activity fidelity via telephone by providing the positive feedback and increasing confidences, all at once the researcher promoted recording of self-reported level of physical activity and provided feedback. The researcher assessed arising individualized barriers and needs for respond to participants' needs and barriers.

Week 8 and 10: the research assistants (RAs) collected data by using the HRQOLQ.

Data collection for control group

The control group received usual care during the 10-week period including week 1-6, the participants received usual care from health care providers, after that in week 8 and 10, RAs collected data by using HRQOLQ (see Figure 1).

Data analysis

Data were analyzed by using descriptive statistics and Repeated Measures Analysis of Variance (Repeated Measures ANOVA).

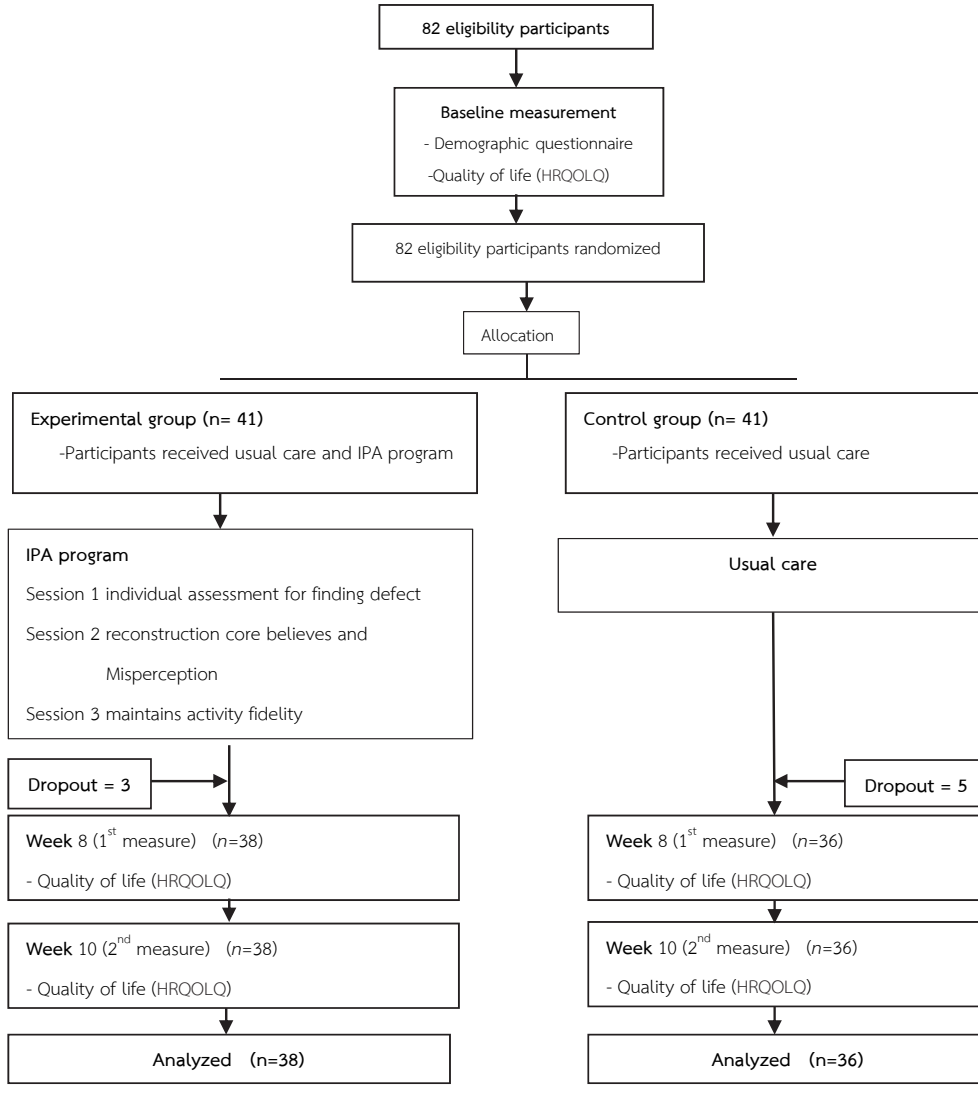


Figure 1 Flow chart of participants' recruitment and allocation

Results

Baseline demographic differences between experimental and control group were examined by using Pearson Chi-square tests and Independent t-test. All characteristics between the experimental and control groups were not significant differences (p> .05). In the experimental group, the majority was; mean age of 68.05 (SD=8.61), male (94.7%), Buddhists (89.5%), married (60.5%), farmer (47.4%), completed primary school (78.9%), had good/enough incomes (65.8%), taking care by givers (89.5%), history of smoking (94.7%) and alcohol drinking (81.6%), received medical treatment were short and long acting bronchodilator with inhaler steroid (81.6%), no comorbidity (73.7%), and no history of acute exacerbation last year (94.7%).

In the control group, the majority was; mean age of 67.92 (SD=8.81), male (86.1%), Buddhists (88.9%), married (61.1%), and farmer (48.1%), completed primary school (72.2%), had good/enough

incomes (80.6%), taking care by givers (88.9%), reported history of smoking (86.1%) and alcohol drinking (94.5%), received medical treatment were short and long acting bronchodilator with inhaler steroid (72.2%) , no comorbidity (83.3%) and no history of acute exacerbation last year (100%).

Table 1 show that the experimental group having low impact of disease that was measured by HRQOLQ, indicating having more quality of life over time. The mean scores of health related quality of life at baseline in control group was 28.17 (SD = 3.21), and in the experimental group was 29.47(SD = 2.92). The lowest mean score in the experimental group was found at 10th week (mean=16.24, SD = 3.07), meanwhile the lowest mean score in the control group was found at 8th week (mean= 25.39, SD =3.08).

In Table 2, two-way Repeated Measures ANOVA was used to examine the difference in health-related quality of life score between group and three time periods. The main effect of health-related quality of life mean score was statistically significant between groups, $F_{(1, 72)}$ =38.88, p< .01. There were significant differences in health-related quality of life mean scores in at least one pair of the three time points, $F_{(2, 142)}$ =30.50, p<.01. The significant interaction effect of group by time was revealed, $F_{(2, 142)}$ =39.47, p<.05, indicating the health- related quality of life mean score between the experimental and control group was different over time.

Table 1 Mean scores and standard deviations of health-related quality of life at baseline, 8th week, and 10th week

Group	Times					
	Baseline		8th week		10th week	
	Mean	SD	Mean	SD	Mean	SD
Control	28.17	3.21	25.39	3.08	25.69	3.89
Experimental	29.47	2.92	19.42	3.52	16.24	3.07

Table 2 Repeated Measures ANOVA of health- related quality of life

Source of variation	*SS*	*df*	*MS*	*F*	*p*
Between subjects	1261.07	73			
Group	52.10	1	61.44	38.88	<.01
Error	626.54	72	34.77		
Within subjects	503.11	44			
Time	75.89	2	5.92	30.50	<.01
Group × Time	23.73	2	4.93	39.47	<.05
Error	429.76	142	3.70		

Discussion

The findings from this study support that the IPA program is effective to improve the quality of life in mild to moderated COPD persons at post-test and follow-up. Our study shows that tailored physical activity strategy is feasible and effectively enhances daily physical activity and physical fitness, in addition to leading increasing health-related quality of life. The increase in daily physical activity level of COPD patients in the IPA program is supported by study of Hospes et al. (2009), who show enhance of daily physical activity and improve physical fitness, as well as increasing QOL among stable COPD person from results of an IPA program.

This program helped the participants, through tailored education, supported health decision making, promoted self-monitoring, and promoted self-efficacy for improving efficacy of person with COPD to modify physical activity behaviors and sustained maximized activity in daily life. Tailoring strategy provided physical activity knowledge by focused on using individualized need and necessary by consistency with individualized daily life contexts (Golpe, 2013; Leidy et al., 2014). Moreover, this intervention provided a personal autonomy support their self-efficacy, the strategy was stepwise goal setting technique by the participants easy to meet goal which they could set activity that they needed to remain activity before being COPD patient by themselves. In addition, mostly of participants received medical treatment which good control their clinical symptoms (77%) and successful smoking cessation (90.5%) that effect to improve physical capacity. If participants perceived a better functional ability, they could perceive lower impacts of disease that it means they perceive better quality of life simultaneously.

For a better quality of life, it might be advantageous for COPD persons to maintain daily physical activity as an integral part of everyday life and to remain mobile, as for example walking to work, going shopping and meeting friends on foot. Throughout the program, the participants and interventionist collaboratively to worked recognizing participants 'perspective, acknowledging their feelings, providing positive feedback, offering choices in assessment where reasonable, providing relevant information and minimizing pressure were also more emphasized by tailored communication which congruent with each individualized, they were more likely to adopt the behaviors decided for a long time. There were evidences supports that tailored education, support health decision making, promote self-monitoring, promote self-efficacy to design their activity management had the potential to improve health-related quality of life in the long term period (Durr et al., 2014; Huixia et al., 2015).

Implementation

Finding revealed that the IPA program could be an effective intervention for nurses at outpatient department in provincial or regional center hospital who could apply the program to improve physical ability and behavior of stable COPD persons resulting in achieving QOL.

Limitation of the study

Limitation of this study is only evaluated patients until 10 weeks after finishing program. Data regarding the long-term effects of tailored physical activity program are still lacking. Although this study proved that tailored physical activity program can achieve a significant effect in the short term, and its long-term effect is uncertain from changing staging of COPD disease.

Recommendations for future research

In further studies, continuing and maintaining the effect of tailored physical activity program remains to be researched, in addition to planning program for every stage of COPD disease.

Conclusion

The IPA program demonstrated positive effects on quality of life. The participants in the IPA program group represented the benefits of program such as improved positive perceptions, self-confidence and increased abilities to perform and sustain health behaviors leading to improve quality of life among mild or moderated COPD persons.

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