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Effect of Buteyko Method on Asthma Control and Quality of Life of Filipino Adults with Bronchial Asthma

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Abstract

Background: The Buteyko Method is a non-pharmaceutical technique that has shown to be effective in decreasing the frequency and severity of asthma attacks in certain populations.

Objectives: The aim of this study is to determine the effect of the Buteyko Method on asthma control and quality of life in Filipino adults with bronchial asthma.

Methods: A quasi-experimental approach with pre-test and post-test design was used to evaluate the effect of the Buteyko Method. Sixteen adults with bronchial asthma, aged 18-40 years old, participated in the study. The experimental group (n=8) was given a 2 hour lecture on Buteyko Method and performed 90 minutes of breathing exercises daily. The control group (n=8) continued their usual treatment regimen. Asthma control and quality of life scores were measured every week for four consecutive weeks using the Asthma Control Questionnaire (ACQ) and Asthma Quality of Life Questionnaire (AQLQ).

Findings: The experimental group showed a significant improvement in asthma control scores ($p=0.029$) and quality of life scores ($p=0.006$) after the 4 week period. The control group, however, showed no significant differences in asthma control scores ($p=0.289$) nor in their quality of life scores ($p=0.390$).

Conclusion: The Buteyko Method has a significant positive effect on asthma control and quality of life when used as adjunct treatment in adults with bronchial asthma.

Keywords: *Buteyko Method, Bronchial Asthma, Asthma Control, Asthma Quality of Life*

1. INTRODUCTION

Asthma is a disease where hyper responsiveness, mucosal edema and mucus production occurs in the airways. This causes signs and symptoms such as coughing, wheezing, chest tightness and dyspnea (Global Initiative for Asthma, 2014). In 2013, the WHO estimated 235 million people suffer from asthma worldwide. Their 2011 data suggests that in the Philippines, 10,471 people died of asthma in that year alone. This represents 2.48% of the total deaths of that year. The age adjusted death rate is 19.48 per 100,000 of the population. The incidence of asthma in the Philippines is ranked as the 24th highest rate in the world.

In a study by Lai et al. (2004) on asthma in Asia-Pacific countries, out of 10.7 million people who suffer from asthma, as little as only 2% have controlled asthma.

Asthma is currently treated medically. However, non-pharmaceutical innovations such as breathing techniques have been recently introduced. Those techniques stabilize the abnormal breathing patterns which may be contributory to the difficulty in breathing experienced by asthmatics. One such technique gaining popularity is the Buteyko Method.

The Buteyko Method was originally developed by Dr. Konstantin Buteyko. The Method proposes to control breathing to lessen hyperventilation which may also precipitate asthma. Practitioners of the method claim that asthmatics using their technique achieve improved asthma control, improved quality of life, and reduced medicine use.

Recently published clinical trials suggest that the Buteyko Method is safe for use. It has a few trials conducted on adults and no published trials for children.

Based on these trials, the Buteyko Method appears to be a promising therapeutic intervention. However, because the number of these studies have been few, many health care workers and asthma sufferers are still skeptical of its proposed promise.

In recent years, international interest on the Buteyko Method has been picking up. It has become a subject of interest by healthcare professionals. Its potential scientific foundation, cost-effectiveness, and non-invasiveness have practical applications if proven effective. More studies are probably still needed for it to be accepted by the public and especially by members of the healthcare team.

Practitioners of this technique hope that there will be a worldwide recognition of this method. They see the potential for it to treat a wider range of problems beyond asthma.

In the Philippines, there are only two certified practitioners of this method. Furthermore, there are no published studies on the Buteyko Method on adult Filipinos as subjects. These, as well as other factors, make the Buteyko Method virtually unknown to most of the population.

Because of doubts on the Buteyko Method's effectiveness, the authors have decided to further investigate its claims, particularly on Filipino adults who suffer from asthma. The authors would like to measure the effects of using the Buteyko Method in regards to subjects' asthma control and quality of life when it is added to a standard asthma treatment. It is the hope of the authors that their results may further guide clinicians in their decision to recommend or disregard the Buteyko Method.

2. LITERATURE REVIEW

The Buteyko Method was developed by the late Russian physician Konstantin Buteyko (1923–2003). He connected hyperventilation with asthma as well as a variety of other diseases. He developed the technique in the 1950's.

His theory on hyperventilation was supported by Thomas et al. (2001) who surveyed 210 asthmatic subjects. Thomas study showed that one-third of asthmatic females and one-fifth of asthmatic males suffered from hyperventilation. This theory was further supported by Osborne et al. (2000) whose study showed that asthmatic subjects had lower carbon dioxide levels compared to healthy individuals.

The Buteyko Method gained popularity in Russia, and has been made available in different parts of the world.

The method aims to reduce hyperventilation by teaching people how to hold their breath and incorporate “shallow breathing” exercises with relaxation.

The Buteyko Method also proposes the use of the diaphragm for breathing at all times. Participants are discouraged from using their accessory muscles for breathing.

This technique encourages users to practice nasal breathing at all times. The nasal passages are physiologically better at filtering and humidifying inhaled air. Besides this, nasal breathing has recently been shown to improve blood levels of nitrous oxide as well. To induce nasal breathing during sleep, Buteyko Practitioners encourage users to keep their mouth closed during sleep. This can be done by taping their lips together with medical-grade microporous tape at night.

The Buteyko Method also proposes to measure the carbon dioxide levels in the blood stream by using a variation of the breath holding time, called the “Control Pause”. Breath holds can be measured in seconds, and is believed to correlate to one's health status.

Beyond breathing, the Buteyko Method also proposes lifestyle changes including diet, allergy avoidance, and stress management.

2.1 Positive Correlation of Buteyko Method with Asthma

In a study by Hassan, Riad, and Ahmed (2012), 40 subjects (aged 30 to 50) were divided into two equal groups (control and experimental). A six-week program for Buteyko Method was conducted and results from the intervention revealed that those who performed the Buteyko Method had significantly improved their peak expiratory flow rate (PEFR) by a mean of 51%. This was significantly better than the control group which only improved by 3%. Furthermore, the experimental group had demonstrated a mean of 52% improvement in their asthma control test scores. The control group only managed to improve by 0.8%. Hassan, et al. concluded that the technique significantly improved the PEFR and reduce asthma daily symptoms.

Cowie et al. (2008) also maintain that Buteyko Method is an effective technique in improving asthma control and quality of life. Their study showed that subjects instructed with the Buteyko Method reduced their use of inhaled corticosteroids and inhaled beta-agonist medications

significantly better than the control. An improvement in the proportion of subjects achieving asthma control was also noted in both the Buteyko and control groups.

In 2013, Lina et al. (2013) demonstrated that pediatric children can benefit from the Buteyko Method as well. Her study applied the Buteyko Method to ten school-aged children (7 to 11 years old). The children taught the Buteyko Method showed significantly improved scores for both their asthma control test and the pediatric asthma quality of life questionnaires. These improvements were absent in their control population.

Various lower level evidence also support the Buteyko Method. These include testimonials from previous patients. In 2012, Madarang published an article at a local newspaper asserting the Buteyko Method's effectiveness after he had undergone training with a certified practitioner. She claims that in less than two weeks, her symptoms were alleviated.

In an article published online, Mercola (2013) stated that Buteyko Method is a powerful approach in reversing health problems associated with dysfunctional breathing. Humbleton (2013), a respiratory nurse specialist, also mentioned that patients can experience benefits from the Buteyko Method. These may include improved control over panic and asthma attacks. Improved breathing control and reduced use of bronchodilator were also noted.

2.2 Negative Correlation of Buteyko Method with Asthma

Albietz (2009) argues that studies conducted regarding the Buteyko Method provided results based on participants' perception only. Moreover, studies on the Buteyko Method suffer from the use of a small sample sizes.

Cooper et al. conducted a cross-sectional controlled trial on 51 subjects with symptomatic asthma. Subjects were asked to do breathing exercises at night followed by the use of mouth taping with a microporous tape. The study used a 2-week period of using the technique followed by a minimum 2-weeks without the method as a washout period. Their results show that mouth taping during sleep produced no significant improvement in the asthma scores of their participants.

Courtney et al. also recorded a negative correlation between breath holding time and end tidal carbon dioxide, directly opposite to Buteyko's claims. However, the study also proposed that Buteyko Method might influence breathing symptoms by improving the efficiency of biomechanics of breathing.

2.3 Research Questions

- 1.) Is there a significant difference in asthma control pre-test scores between the control and experimental group?
- 2.) Is there a significant difference in asthma quality of life pre-test scores between the control and experimental group?
- 3.) Is there a significant difference in asthma control post-test scores between the control and experimental group?

4.) Is there a significant difference in asthma quality of life post-test scores between the control and experimental group?

5.) Is there a significant difference between the asthma control pre-test scores and post-test scores of the experimental and control group?

6.) Is there a significant difference between the asthma quality of life pre-test scores and post-test scores of the experimental and control group?

2.4 Research Hypotheses

Null hypothesis 1 (H_01): There is no significant difference in asthma control pre- test scores between the control and experimental group.

Null hypothesis 2 (H_02): There is no significant difference in asthma control post- test scores between the control and experimental group.

Null hypothesis 3 (H_03): There is no significant difference in quality of life pre- test scores between the control and experimental group.

Null Hypothesis 4 (H_04): There is no significant difference between the asthma quality of life post test-scores of the control and experimental group.

Null Hypothesis 5 (H_05): There is no significant difference in the asthma control pre-test and post-test scores of the experimental and control group.

Null Hypothesis 6 (H_06): There is no significant difference in the asthma quality of life of life pre-test and post-test scores of the experimental and control group.

2.5 Definition of Terms

The following terms are conceptual definitions and are based on published literature.

- Buteyko Method – A technique that is aimed at treating hyperventilation using breathing exercises, and lifestyle modifications.

- Asthma Control – The amount of control a person has over the exacerbation of asthma symptoms such as wheezing, coughing, chest tightness, and dyspnea. This also factors dependence on medications, such as bronchodilators, to treat symptoms. One way to measure it is through the Asthma Control Questionnaire (ACQ).

- Asthma Quality of Life – The degree of impairment experienced based on the interruptions in the physical, social, occupational, and emotional activities. It is measured by the Asthma Quality of Life Questionnaire (AQLQ).

- Filipino – A citizen of the Republic of the Philippines.

- Bronchial Asthma – It is a chronic airway disease that inflames and narrows the airways which can cause wheezing, coughing, Chest tightness, and difficulty in breathing. It can occur at any age but it usually begins in childhood.

3. THEORETICAL FRAMEWORK

The study utilizes Katherine Kolcaba's Comfort theory as it focuses on a holistic medicine that seeks to prioritize patient's comfort. According to this theory, comfort is divided into three states: "relief (use of medications), ease (or calm, in a psychological or emotional sense) and transcendence (a form of inner strength in which patients feel greater control over their condition and ability to heal)."

In this study, subjects will receive an intervention that may relieve them of the signs and symptoms of asthma. This intervention claims to be an inexpensive and non-invasive way to make the subjects feel more control in managing their condition.

The Buteyko Method exercises will be taught by a Buteyko practitioner. The subjects will continue their exercises at home. They will be followed up for 4 weeks. Their symptoms and quality of life will be assessed and recorded. In effect, these behaviors may affect the results of the study and their prognosis as well.

4. METHODS

4.1 Research Design

A quasi-experimental study was used to evaluate the effect of the Buteyko Method. Manipulation was achieved through implementation of the said breathing technique in only one group (experimental). On the other hand, the control group did not receive any instructions about Buteyko Method but instead continued their usual management (e.g. use of bronchodilators or corticosteroids) for asthma. Instead of randomization, subjects were divided into 2 groups based on their order of entry into the program. The first nine subjects were assigned the experimental group. The last eight were included in the control.

Pre-test and post- test design was used to compare the experimental and control groups and determine the effect of Buteyko Method.

4.2 Subjects of the Study and Sampling Procedure

Purposive sampling was used to determine the subjects who participated in the study with regard to a specific purpose. With this sampling procedure, subjects were chosen based on a set of criteria created by the researchers for the need to evaluate the effect of the treatment specifically in asthmatic subjects.

This study was limited to 20 asthmatic adults. This number was determined based on the data from a study on the effect of Buteyko Method in adults with bronchial asthma by Hassan, Riad, and Ahmed done in 2012. Means and standard deviations from this research were used to get the sample size for this study using the continuous outcome superiority trial formula. In addition, only a maximum of 10 subjects in the experimental group was allowed. This was to ensure the quality of teaching and demonstration during the teaching session (Lapa&Lapa, 2011).

Inclusion criteria includes (1) must be a Filipino citizen, (2) aged 18 to 40 years old, (3) must be diagnosed by a physician with bronchial asthma for at least three years, (4) must be taking bronchodilators and corticosteroids for his/her management of asthma, (5) must be willing and able to be contacted through mobile phone.

Exclusion criteria includes: (1) those who were pregnant at the time of screening, (2) with cardiac disease, (3) mental incapacity, (4) with communicable diseases as determined by a physician, or (5) those who have received previous instructions on the Buteyko Method.

Subjects who met the criteria were briefed and were included as part of the study only after they had given their full informed consent for the study.

4.3 Setting

The study was conducted at Sampaloc, Manila City. Exercises for both the control and experimental groups were done at the individual houses of subjects. The experimental group was asked to attend 1 session done at a tertiary hospital.

4.4 Recruitment of Subjects

The trial was advertised through 250 flyers distributed to individuals living in the vicinity of Sampaloc, Manila. In particular, residents living near the University of Santo Tomas, Mary Chiles General Hospital, Belmonte Health Center, Earnshaw Health Center, Jhocson Health Center, and Maria Clara Health Center.

113 asthmatic individuals were screened as potential subjects of the study. 16 refused to participate, 20 could not be contacted by phone, 47 failed to meet the age criteria, 3 had cardiac disease, 1 was pregnant, and 1 had pneumonia. Another 8 had voluntarily removed themselves from participating due to personal reasons.

An initial 17 respondents participated in the study. 1 subject was unable to follow the study's protocol and was removed from the trial. In the end, 8 subjects were included as part of the experimental group while 8 subjects were part of the control group.

4.5 Research Instruments

4.5.1 Filipino Version of the Asthma Control Questionnaire (ACQ)

Asthma control was evaluated through the Filipino version of the Asthma Control Questionnaire. The original ACQ was authored by Professor Elizabeth Juniper. The Filipino version was translated and validated by the MAPI Research Institute. It is a 7-item questionnaire. The first 6 items can be answered by subjects using a 7-point Likert scale with 0 as totally controlled and 6 as strictly uncontrolled. The first 6 questions rate the frequency of asthma attacks and symptoms, the usage of medication, and the assessment of the individual's condition. The last item of the questionnaire is rated based on the individual's ability to achieve the predicted Peak Expiratory Flow Rate (PEFR).

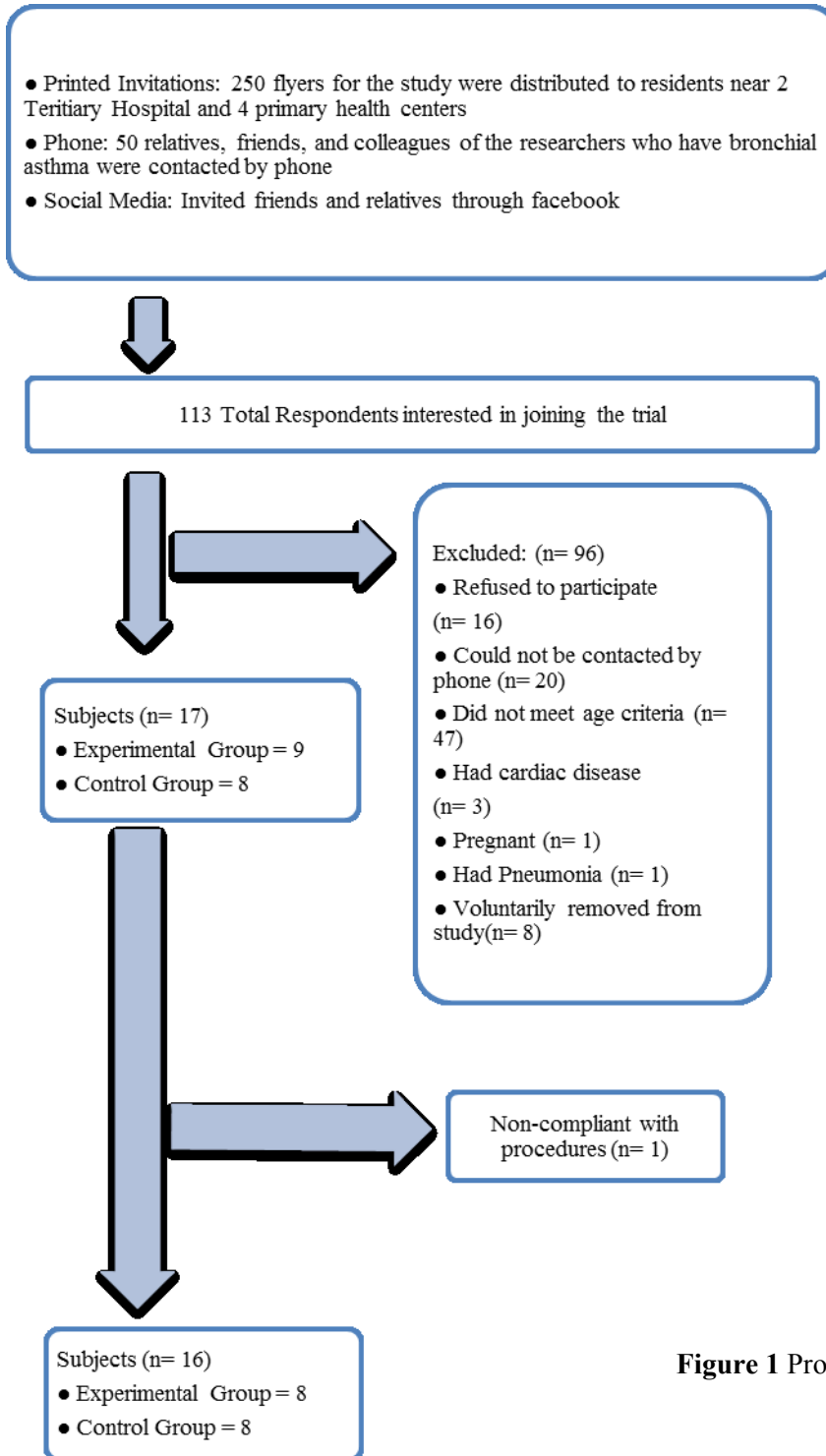


Figure 1 Process of Subject Recruitment

The PEFr was obtained through the use of a generic Peak Flow device. All the participants had used the same peak flow meter for their measurements. Disposable mouthpieces were custom-made for each participant to ensure hygiene. Its results were converted to a value from 0-6 based on a formula provided by Juniper.

Each question is equally weighted and the final score is expressed in the average of the 7 questions. Final scores follow the same scoring of 0 to 6 where 0 = totally controlled and 6 = strictly uncontrolled.

A cut-off score of 1.5 may be used to delineate *well-controlled* from *not well controlled* asthma. Using this value, the Questionnaire has a Positive Predictive Value of 0.88 in determining *not well controlled asthma*.

4.5.2 Filipino Version of the Asthma Quality of Life Questionnaire (AQLQ)

The Asthma Quality of Life Questionnaire was developed by Professor Elizabeth Juniper. It was translated and validated by MAPI Research Institute to produce the Filipino version.

It contained 32 items that were aimed to gather information on the physical and emotional impact of asthma to the subjects based on a weekly recall. Four specific areas were evaluated. These were symptoms, activity limitation, emotional function, and environmental exposure. A 7-point Likert scale (7= no impairment at all, 1= with severe impairment) was used for the scoring. Higher scores on the questionnaire generally reflect better quality of life (Asthma Quality of Life, 2014).

4.5.3 Statistics Software

IBM SPSS version 21.0 running on a Microsoft Windows version 7 operating system was used for statistical analysis.

4.6 Pilot Testing of Instruments

All instruments were pilot tested on 16 subjects who were not part of the trial prior to use.

Results of pilot testing showed the Cronbach's alpha for ACQ to be 0.903 and AQLQ to be 0.929. Thus, these confirmed that the questionnaires have a high internal consistency.

4.7 Data Collection Procedures

4.7.1 Pre – Intervention

Pre-test scores of the ACQ and AQLQ were obtained by asking the subjects to answer the Filipino Version of the Asthma Control Questionnaire and the Filipino Version of the Asthma Quality of Life Questionnaire.

4.7.2 During the Intervention

The experimental group was asked to attend 1 session of Buteyko Method instruction by a certified Buteyko practitioner. The session lasted for two hours. After subjects learned the exercises, they were instructed to do this at home for 30 minutes, thrice a day. They were given a take-home checklist to monitor the time spent exercising. They were also reminded through

an automated SMS three times daily. Neither the Buteyko practitioner nor the subjects were allowed to contact each other after the session.

The control group was met by the researchers regularly and advised to continue their usual treatment for asthma as instructed by their physicians. Regular visits to their household by the researchers ensured good compliance with their medication.

4.7.3 Post – Intervention

Subjects were followed-up weekly. They were asked to answer the questionnaires on ACQ, and AQLQ once a week for 4 weeks. The answers of subjects taken during the 4th week were used for analysis of their post-test scores.

4.8 Data Analysis

Pre-test and post-test mean scores of each group were analyzed through the use of paired t-test. To determine if the hypotheses should be accepted or rejected, independent t-test was utilized.

4.9 Ethical Considerations

The study was approved by the University of Santo Tomas – College of Nursing Ethics Committee, as well as by the Mary Chiles General Hospital Ethics Review Committee. Subjects were not charged a fee for their participation. Informed consent was taken only after the study protocols were presented to subjects in both written and oral formats in a language they can understand.

5. RESULTS AND DISCUSSION

1.) Was there a significant difference in asthma control pre-test scores between the control and experimental group?

Table 1. Comparison of Asthma Control Pre-test Mean Scores of the Control and Experimental Group

	Control		Experimental		t value	p value
	Mean	SD	Mean	SD		
Pre-test Asthma Control	1.3214	1.1448	1.9286	0.7674	-1.246	0.233

*significant at $p \leq 0.10$

There was no significant difference in the asthma control pre-test scores between the control and experimental groups.

As shown in Table 1, the asthma control (ACQ) pre-test mean scores of both control and experimental group are 1.3214 and 1.9286, respectively. Using independent t-test at ninety

percent confidence interval, results revealed that there is no significant difference ($t = -1.246$, $p = 0.233$) in the pre-test mean scores between the control ($M = 1.3214$, $SD = 1.1448$) and experimental group ($M = 1.9286$, $SD = 0.7674$).

Despite not having a significant difference in the t test, we note that the experimental group had a score above our cut-off of 1.5 which means that they have a higher chance of having asthma that is *not well controlled*.

2.) Was there a significant difference in the asthma quality of life pre-test mean scores between the control and experimental group?

Table 2. Comparison of Asthma Quality of Life Pre-test Mean Scores of the Control and Experimental Group

	Control		Experimental		t value	p value
	Mean	SD	Mean	SD		
Pre-test Asthma Quality of Life	5.2227	0.9729	4.2773	0.6805	2.252	0.041

*significant at $p \leq 0.10$

The asthma quality of life (AQLQ) of the control group has a pre-test mean score of 5.2227 while the experimental group has a pre-test mean score of 4.2773. Using the same confidence interval, results revealed that there is a p value of 0.041. This shows that the experimental group had a significantly worse asthma quality of life scores compared to their control counterparts.

The researchers have speculated that this difference will not invalidate the results of their study.

3.) Was there a significant difference in asthma control post-test scores between the control and experimental group?

Table 3. Comparison of Asthma Control Post-Test Mean Scores of the Control and Experimental Group

	Control		Experimental		t value	p value
	Mean	SD	Mean	SD		
Post-test Asthma Control	1.6786	1.2163	1.4643	0.6422	0.441	0.668

*significant at $p \leq 0.10$

There was no significant difference in asthma control post-test scores between the control and experimental group ($t= 0.441$, $p=0.668$).

These results were obtained using an independent t-test with a 90% confidence level (p value of 0.10). The mean score for the control group was 1.679 with a standard deviation of 1.216 and the mean score for the experimental group was 1.464 with a standard deviation of 0.642.

Based on the ACQ scores, the control group now measured above the ACQ cut-off which shows that they have a higher chance of having *not well controlled* asthma compared to the experimental group (Juniper, 2008).

4.) Was there a significant difference in asthma quality of life post-test scores between the control and experimental groups?

Table 4. Comparison of Asthma Quality of Life Post-test Mean Scores of the Control and Experimental Group

	Control		Experimental		t value	p value
	Mean	SD	Mean	SD		
Post-test Asthma Quality of Life	5.504	1.2620	5.559	0.837	-0.102	0.920

*significant at $p \leq 0.10$

There is no significant difference between the asthma quality of life post-test scores between the control and experimental groups ($t= -0.102$, $p= 0.920$). The results were obtained by independent t-test with a 90% confidence interval (p value of 0.10). The mean score of the post-test quality of life for the control group was 5.504 with a standard deviation of 1.262. The experimental group had a mean post-test quality of life score of 5.559 with a standard deviation of 0.837. Both groups experienced little to no impairment of activities by the end of the experiment.

5.) Was there a significant difference between the asthma control pre-test scores and post-test scores of the control and experimental group?

Table 5. Comparison of Asthma Control Pre-test and Post-test Mean Scores of the Control and Experimental Group

Asthma Control	Pre-test		Post-test		t value	P value
	Mean	SD	Mean	SD		
Control	1.321	1.145	1.679	1.216	-1.147	0.289
Experimental	1.929	0.767	1.464	0.642	2.728	0.029

*significant at $p \leq 0.10$

Findings show that the control group had a pre-test mean score of 1.321 and a post-test mean score of 1.679. The experimental group had a pre-test mean score of 1.929 and post-test mean score of 1.464.

The experimental group appears to have a better score post-intervention compared to the control. Furthermore, the control group's mean scores had worsened while the experimental group's mean score improved from their pre-test values.

Using paired t-test and a confidence level of 90% (p value of 0.10), results revealed that there is no significant difference in the asthma control pre-test and post-test scores of the control group ($t = -1.147$, $p = 0.289$). The experimental group however, shows a significant improvement in their asthma control pre-test and post-test scores ($t = 2.728$, $p = 0.029$).

The findings of the study suggest that the application of the Buteyko Method can improve asthma control in asthmatic subjects. It is consistent with the results of previous studies by Cowie et al and Hassan et al in 2008 and 2012, respectively.

Cowie et al (2008) showed that number of subjects achieving control of asthma in the Buteyko arm improved from 40% pre-intervention, to 70% post-intervention.

These also concur Hassan et al (2012) who revealed administering the technique decreased asthma daily symptoms and improved the peak expiratory flow rate.

The improvement in the asthma control of the experimental group suggests that Buteyko Method is able to control asthma symptoms and improve overall asthma control.

6.) Is there a significant difference between the asthma quality of life pre-test scores and post-test scores of the experimental and control group?

Table 6. Comparison of Asthma Quality of Life Pre-test and Post-test Mean Scores of the Control and Experimental Group

Asthma Quality of Life	Pre-test		Post-test		t value	p value
	Mean	SD	Mean	SD		
Control	5.223	0.097	5.504	1.262	-0.917	0.390
Experimental	4.277	0.680	5.559	0.837	-3.846	0.006

*significant at $p \leq 0.10$

Results reveal that the control group had an asthma quality of life pre-test mean score of 5.223 and a post-test score of 5.504. The experimental group had a pre-test mean score of 4.227 and a post-test mean score of 5.559.

The scores indicate that both groups had little to no impairment in their quality of life. Although both groups had improved their scores post-intervention, the experimental group appears to have had a bigger improvement.

Using paired t-test and a confidence level of 90% ($p=0.10$), it is shown that the control group did not have significant difference in its quality of life pre-test and post-test scores ($t= -0.917$, $p=0.390$). On the other hand, the experimental group showed a significant improvement 4 weeks after the introduction of the breathing exercises ($t=-3.846$, $p=0.006$).

The findings reveal that Buteyko Method can improve the quality of life of asthmatic subjects. These affirm Opat et al's results in their study conducted in 2000. They found that subjects who learned it through video instruction were able to significantly improve their well-being.

This data suggests that the Buteyko Method can improve the physical, social, emotional, and occupational impact of asthma as seen in the overall improvement of the subjects' quality of life scores.

6. CONCLUSIONS

Based on the results of the study, the Buteyko Method may be an effective add-on to current medical management. It may help improve asthma control and quality of life.

7. RECOMMENDATIONS

The researchers recommend that Buteyko Method be added as a possible medical and nursing intervention in managing asthmatic adults. They also suggest further studies regarding Buteyko Method to be conducted. These may involve evaluation of its effect to the peak expiratory flow rate, its difference from other breathing techniques in controlling and managing

asthma attacks, its effect on the community setting, its cost-effectiveness, and long-term trials with larger population bases.

8. LIMITATIONS

This research study did not study all the recommendations provided in a standard Buteyko Method course. Subjects of the experimental group only met the Buteyko practitioner once. They were instructed only with the basic breathing exercises. More advanced exercises, lifestyle modifications, and mouth taping during sleep were not applied during this study.

Another limitation concerns the control group. Although they were not taught the Buteyko Method, the investigators could not rule out the possibility that subjects from the control group may have learned it from other sources during the course of the trial.

Although the asthma control questionnaire has incorporated the frequency of medication use as one of its parameters, the study was not powered to compare the subjects' medication use before and after the intervention.

Lastly, the study was not designed to explore the relationship between hyperventilation and asthma. Thus, although its findings can support the use of the Buteyko Method for possible therapy for asthmatics, it cannot substantiate on the hyperventilation theory which the Buteyko Method is supposedly based on.

9. CONFLICT OF INTEREST STATEMENT

Dr. Charles Edward Florendo is the medical adviser of the Buteyko Clinics International, and is a member of the Buteyko Breathing Association. He does not receive financial remuneration from the said groups.

All other authors have no conflicts of interest to declare.

SUPPORT STATEMENT

The authors had funded this study with their personal money. They did not receive donations nor remuneration from external sources.

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