THE EFFECTIVENESS OF SPECIFIC HEALTH EDUCATION IN PROVIDING BETTER QUALITY OF LIFE AMONG ASTHMATIC PATIENTS AT PRIMARY CARE SETTING IN HUSM

By
DR YUSNITA BINTI YUSOF

Dissertation Submitted In Partial Fulfillment Of
The Requirements For
The Degree Of Master Of Medicine
(Family Medicine)

UNIVERSITI SAINS MALAYSIA
MAY 2006

ACKNOWLEDGEMENTS

I owe a debt of gratitude to those who were so generous with their time and expertise:

Dr. Harmy Mohamed Yusoff who has been very patient and helpful. His generosity with his time and guidance was invaluable in writing this dissertation.

A tip of the hat to Dr. Azmani Wahab who has helped in formulating and analyzing the data; without whom the research might not be completed.

My special appreciation to the School of Medical Sciences, Universiti Sains Malaysia, Kelantan for the approved short-term grant.

Gratitudes also to Dr. Shaiful Bahari Ismail, Head of Family Medicine Department and all the lecturers in the department.

And Siti Najihah for being such a great assistant.

Kudos and heartfelt thanks to all the staffs in Klinik Rawatan Keluarga and bouquets to dear and valued friends.

I wish also to express my appreciation to the participants. Bless you all.

Finally, a special award to dear husband and son for your support, understanding and encouragement.

The expertise in this study belongs to those listed above. Any errors are mine.

Yusnita Yusof

TABLE OF CONTENT

List of tables

List of appendices

ABBREVIATIONS

AIRIAP -Asthma Insight And Reality In Asia Pacific

AQLQ -Asthma Quality Of Life Questionnaire

HUSM -Hospital Universiti Sains Malaysia

ICU -Intensive Care Unit

KRK -Klinik Rawatan Keluarga

MAPI -Members of Asthma Project Initiatives

MDI -Metered Dose Inhaler

MID -Minimal Important Difference

NAEP -National Asthma Education And Prevention

NHMS -National Health And Morbidity Survey

USA -United States Of America

PEF -Peak Expiratory Flow

PEFR -Peak Expiratory Flow Rate

Q -Question

SD -Standard Deviation

SPSS -Statistical Package For Social Sciences

Abstrak

Keberkesanan Pendidikan Kesihatan Yang Spesifik kepada Pesakit Asma Dalam Meningkatkan Kualiti Hidup Di Peringkat Penjagaan Primer Di HUSM.

Morbiditi penyakit asma yang meningkat secara global memerlukan pendekatan terperinci dalam aspek pengurusannya. Pengurusan asma yang ideal melibatkan pencapaian kawalan gejala yang baik, peningkatan kualiti hidup dan pendidikan kepada pesakit. Tujuan kajian intervensi ini adalah untuk menilai keberkesanan program pendidikan kesihatan khusus bagi pesakit asma.

Maka, satu kajian intervensi telah dijalankan di kalangan pesakit asma di Klinik Rawatan Keluarga, HUSM dari bulan April, 2004 hingga Januari, 2005. Seramai 130 pesakit asma telah dikaji di mana 60 orang daripada mereka dikategorikan dalam kumpulan yang menerima pendidikan. Manakala, 70 orang lagi dikategorikan dalam kumpulan kawalan. Hasil kajian yang diteliti adalah kualiti hidup pesakit asma. Soal selidik Kualiti Hidup Pesakit Asma (AQLQ) versi Bahasa Melayu telah digunakan untuk menilai kualiti hidup di kalangan pesakit asma.

Kumpulan yang menerima pendidikan telah hadir program yang dijalankan secara individu pada peringkat permulaan diikuti oleh kaunseling berkumpulan yang terdiri daripada lima hingga sepuluh pesakit bagi setiap kumpulan pada peringkat kedua. Semuanya dilaksanakan secara interaktif. Program ini meliputi maklumat tentang asma,

tunjukajar berkaitan penggunaan ubatan dan melatih teknik inhaler yang betul. Maklumat berkenaan mengenalpasti dan mengawal serangan asma dan tanda-tanda awal serangan turut diberikan. Manakala, kumpulan kawalan menerima rawatan rutin yang disediakan di klinik tanpa tunjukajar secara formal berkaitan kawalan asma.

Keputusannya, kumpulan yang menerima pendidikan menunjukkan perbezaan yang ketara berbanding kumpulan kawalan dari segi kualiti hidup secara menyeluruh meliputi limitasi aktiviti, gejala, fungsi emosi dan rangsangan persekitaran. Kadar pengiraan keseluruhan bagi setiap soal selidik juga menunjukkan peningkatan jumlah mereka yang mendapat skor 'lebih baik' adalah dari kumpulan intervensi berbanding kumpulan kawalan. Namun, bagi pengukuran PEFR keputusan yang diperolehi memberikan perbezaan yang tidak ketara dalam kumpulan intervensi.

Kesimpulannya, program pendidikan telah memberikan kemajuan yang ketara dalam peningkatan kualiti hidup bagi pesakit asma. Perlaksanaan program sebegini adalah boleh dijalankan di peringkat kesihatan primer.

Abstract

The Effectiveness Of Specific Health Education In Providing Better Quality Of Life Among Asthmatic Patients At A Primary Care Setting In HUSM.

The global increase in asthma morbidity requires a closer examination on the aspects of asthma management. The cornerstone of asthma management is achieving adequate symptom control, better quality of life and patient education. The aim of this interventional study was to evaluate the effectiveness of a specific health education programme in the asthmatic patients.

Thus, an interventional study was enrolled among asthmatic patients in Klinik Rawatan Keluarga, HUSM from April 2004 through end of January, 2005. A hundred and thirty asthmatic patients were recruited, 60 of whom were assigned to the intervention group and another 70 to the control group. The outcomes measured were the quality of life . The Malay version of Asthma Quality of Life (AQLQ) Questionnaire was used to assess the quality of life among the asthmatics.

The intervention group attended the programme as scheduled which was conducted individually in the first health education and followed by group counseling of five to ten

participants each in the second health education. They were carried out in an interactive way. The programme included information about asthma, instruction on the appropriate use of medication and training in the metered dose inhaler (MDI) technique and information about the identification and control of asthma attacks and the recognition of early signs of exacerbation. The control group was submitted to the standard care provided at the clinic, with usual asthmatic advice regarding asthma control.

As a result, the intervention group showed significant differences when compared to the control group with respect to the overall quality of life comprising of activity limitations, symptoms, emotional function and environmental stimuli. The global rating of each questionnaire also showed an increase number of those who scored 'better' in the intervention group compared to the control group. However, no significant differences observed in terms of PEFR measurements in the intervention group.

It is concluded that the educational programme led to a significant improvement in the quality of life of the asthmatics and the implementation of such programme is possible at the primary care level.

CHAPTER 1 INTRODUCTION

1.1 Bronchial Asthma

Bronchial asthma is an important chronic health problem, affecting patients of all ages. Its burden on economy is considerable both in terms of direct medical costs such as hospitalization and pharmaceuticals and indirect medical costs such as time lost from work and premature deaths.Therefore, there has been much interest in systematically improving the quality and reducing the cost of caring for patients with chronic illness like asthma (Weingarten *et al.*, 2002).

In recent decades there have been striking advances in the clinical treatment of asthma, yet the morbidity and mortality for the disease are always high. This gap between the scientific evidence and the continuing negative effect of asthma on society depends to a considerable extent on "patient's behaviour and practitioner's performance". In the United States, approximately 14 to 15 million people are afflicted by the disease (American Academy of Allergy, 2002).

In Malaysia, the prevalence of asthma among adults was 4.1% as reported in the Second National Health and Morbidity Survey (NHMS2, 1996) and it varied geographically involving more rural dwellers compared to the city dwellers (NHMS2, 1996). The survey also noted that the lower socio-economic groups namely the lower educational status and the lower income groups were observed to have higher prevalence of asthma.

It also revealed that majority of the asthmatics was mild (87.3%) while the rest were moderate (9.9%) and severe (2.7%) (NHMS2, 1996).

Initiatives to improve the care of asthmatic patients have been studied widely. In the United Kingdom, primary care physician plays a key role in the management of asthma; and the government has introduced incentives for doctors to run specialized clinics to treat chronic conditions including asthma (Premaratne *et al.*, 1999). In Malaysia, there are well recognized specialized clinics at the primary care level in managing chronic conditions namely diabetes mellitus and tuberculosis but to date, there is none for the asthmatics. In these so called specialized clinics many programmes in educating the patients and the public can be organized. Example, educating the asthmatics on the natural history of asthma and its management is crucial in improving the quality of life. Moreover, the impact of asthma on their social life can be measured and this indirectly reflects the quality of care in treating asthma in the primary care clinics.

A study by Oliveira and associates in 1999 concluded that the educational programme led to a significant improvement in asthma morbidity and that the implementation of educational programmes is possible for special populations when these programmes are adapted to the socioeconomic profile of the patients, with a significant gain in terms of the reduction of symptoms and improved pulmonary function and quality of life of asthmatics. Specific to quality of life alone, he found that both the educational and control groups showed a significant improvement in overall quality of life. However,

comparison of the groups at the end of the study showed better scores for the quality of life of the educational group.

Another study by Moudgil *et al.*, 2000 looking at asthma education and quality of life in the community also showed a statistically significant scores in the active group as opposed to the control group.

Rugayah and colleagues, 2000 also thought that asthma is a chronic disorder that can place considerable restrictions on the physical, emotional and social aspects of the patients' lives and may have an impact on their careers. The importance of emotional factors and restriction on social life may be greater if symptoms are inadequately controlled. The underlying disorder by itself may cause distress especially when its natural history is unpredictable. Inappropriate medical care can increase these difficulties. Hence, they agreed that accurate methods of measuring morbidity such as measurement of quality of life are much needed .

1.2 Quality Of Life

As in other parts of the world there has been an increasing need for Malaysian researchers to assess quality of life in their patients. Their practice reflects a growing appreciation of the importance of how patients feel and how satisfied they are with treatment, in addition to the traditional focus on disease outcomes. Researchers had proven that there is no better way to assess quality of life then to ask patients themselves.

Quality of life or general well being is a concept that may be useful for assessing the degree of morbidity caused by asthma. Hooi, 2003 also agreed that the application of patient assessed measures of health outcome has become increasingly important to evaluation of health care. She defined health related quality of life as the functional effect of an illness and the consequent therapy on a patient, as perceived by the patient, and it is a measure of patients' evaluation of their own health compared with what they expect possible or ideal.

Guyatt and Cook, 1994 preferred the term "health-related quality of life" to that of quality of life and they defined it as an individual's satisfaction or happiness with domains of life as far as they affect or are affected by health. It can be differentiated from quality of life in that health-related quality of life concerns itself primarily with those factors that fall under the purview of health care providers and health care systems.

The World Health Organization's task force on Quality of Life defined it as "an individual's perception of his/her position in life in the context of culture and value systems in which he/she lives, and in relation to his/her goals, expectations, standards and concerns" as quoted by Rugayah, 1996.

Quality of life is primarily the outcome measure for health programmes. Being patient-centred in origin, it represents a new wave of health care research and development, essential for assessing the effects of disease and the effectiveness of health care interventions. The new and internationally rapidly expanding field of health outcomes

research is based on such measures. In USA, the Health Care Financing Administration is moving to make quality measurement mandatory for all federally funded health care programmes. Similarly, the Australian federal government now allocates disability programme funding based on functional health status measurement, and are requiring submissions from the pharmaceutical industry employing quality of life measurement (Rugayah *et al.*, 2000).

Liam, 2003 also viewed that traditionally, clinicians and researchers had used clinical or physiological data to routinely evaluate the clinical status of patients with asthma. Such measures are clearly useful in clinical settings but do not address the full impact of asthma on the physical, psychological, emotional and social well being of these patients. Health-related quality of life measures are now routinely incorporated as outcomes in clinical trials of pharmacological treatment and patient education strategies, and have been promoted for use in clinical practice by health care providers as part of the management of their patients with asthma.

1.3 Quality Of Life Questionnaire

Quality of life scales are either general or not specifically designed for patients with asthma, or they may be specific for asthma but not applicable to the general population.

The Medical Outcomes Study Short-Form 36-Item Health Survey (SF-36) is a 36-item instrument designed to measure generic health concepts relevant across age, disease and

treatment groups and is being used extensively as a tool for assessing clinically relevant patient outcomes. It provides a comprehensive and efficient way to measure health from patient's point of view and has been well validated in the social science and medical literature. It has been acknowledged worldwide as a potentially useful international measure of the future (Rugayah *et al.*, 2000).

However, the Asthma Quality of Life Questionnaire (AQLQ) is a disease-specific quality of life questionnaire that has been developed to measure the functional aspects such as physical, emotional and social problems that are troublesome to adults with asthma. It has been rigorously tested to ensure that it is reproducible, valid (it is really measuring the quality of life in asthma), and responsive to change (able to detect important changes in quality of life, even if those changes are small) (Juniper, 1991). Moreover, patients' scores from disease-specific questionnaires often correlate better with various physiological measures and clinical indicators of asthma status than generic instruments.

The principles of questionnaire construction is that it is capable of measuring change over time within individual people. The essential characteristics are that both the physical and emotional health should be measured, the items must reflect areas of function that are important to patients with asthma, summary scores amenable to statistical analysis must be provided, the questionnaire should be responsive to clinically important changes; even if they are small, valid in measuring subjective aspects of health status, short to consider the cost and efficiency, and it should be

capable of being administered by an interviewer or being self-administered (Juniper *et al.*, 1992).

The AQLQ actually fulfills all these criteria. It has four domains namely; activity limitations (eleven items), symptoms (twelve items), emotional functions (five items) and exposure to environmental stimuli (four items); and the individual items within the AQLQ are equally weighted. A unique feature of this questionnaire is that five of the items in the activity domain are "patient-specific". Only approximately ten minutes are required to complete the questionnaire at initial visit and five minutes at subsequent visits (Juniper *et al.*, 1993).

1.4 Asthma Education And The Quality Of Life

The Institute of Health Promotion and Education provides a definition of health promotion and health education in their 2002 (Palmer, 2004) constitution as :

"the practice of health promotion and health education may be described as the organisation and execution of the influences affecting the environment, as well as individual knowledge, attitudes and behaviour, in matters concerning health with a view to enabling communities and individuals to maintain and promote personal and community health and well-being, together with a proper acceptance and use of the health and medical services available".

Providing asthma education in primary care practice is not easy. Many authorities consider education to be an integral component of asthma management. The educational effort should be aimed at altering patients' behaviour rather than simply providing knowledge (Stoloff *et al.*, 1997).

The programme should include information about airway inflammation and also bronchospasm using figures to illustrate the concept; the rationale and methods for avoiding irritants and relevant allergens, demonstration and practice of inhaler technique and monitoring using symptoms or peak expiratory flow (PEF) meters, description of criteria for control and steps to take when control deteriorates, discussion of the action plan and attempt to improve the patient's and family's understanding and willingness to implement the plan when it is needed, demonstration of techniques for successful communication with health care professionals, emphasis on the need for regular follow up, specific information on food allergy and finally discussion, when relevant, of conditions such as pregnancy (Canadian Medical Association, 1999).

A number of studies had tried to assess the impact of asthma education on patient well being. They suggested that, it will improve patients' knowledge, their positive attitudes; greater family communication; increased physical activity and feelings of control; increased use of objective measures of airflow obstruction (e.g. PEF) in determining asthma severity; improved treatment compliance, self-management, inhaler technique, quality of life and pulmonary function; and reduced asthma severity, school absenteeism, emergency room visits, admissions to hospital, health care use and health

care costs (Canadian Medical Association, 1999; Garrett *et al.*, 1994 and Hilton *et al.*, 1986).

Peak expiratory flow rate measurement is the proposed minimum objective parameter for monitoring bronchial asthma. The revised Asthma Management Guidelines, 2002 also stresses the importance of at home monitoring of pulmonary function with mini peak flow meters. Since readings vary between different brands of flow meters, in order to make comparison over time, it is desirable for patients to always use the same meter. The use of these devices should be carefully demonstrated and the interpretation of the results explained. The use of these meters is particularly important for asthmatic patients who are unable to recognize the severity of their condition on the basis of symptoms (Malaysian Clinical Practice Guidelines for Management of Adult Asthma, 2002).

The working group of the Professional Education Subcommittee of the National Asthma Education and Prevention Program (NAEP) coordinated by the National Heart, Lung and Blood Institute extracted key cinical activities that should be considered as essential for quality asthma care. And one of their final conclusions was, asthma education is essential for successful management of the disease (Williams *et al.*, 2003).

Effective asthma education should be developed in a patient-provider partnership, tailored to the individual patient's needs and suited the cultural or ethnic beliefs and practices. At a minimum, competent asthma education enlists and encourages family

support, includes instructions on self-management skills, and is integrated with routine ongoing care. It is provided, either as group or individual patient programmes, to all patients and parents/guardians of children who have had a diagnosis of asthma (Williams *et al.*, 2003).

The use of patient education to improve outcome measures such as morbidity, and compliance had been examined in a number of diseases including asthma. In the large study by Bailey *et al.*, 1990, the intervention group showed an improvement in reported compliance and functional status. An important study by Wilson *et al.*, 1993 also showed that asthma education was beneficial, either as individual education or group education. Significant improvements were seen in control of asthma symptoms and in adherence of patients to their treatment regimens. Group education proved somewhat more effective than individual instructions in terms of reductions of symptoms and decreased utilization of medical care services. Furthermore, a small group education was found to be more cost-effective (Wilson *et al.*, 1993).

In addition, as mentioned before both studies by Oliveira *et al.*, 1999 and Moudgil *et al.*, 2000 discovered that the asthmatics' quality of life were significantly improved with the asthmatic educations introduced.

A clustered randomized trial of an intervention to improve the management of asthma showed that; there was no difference in asthma related quality of life after an educational intervention to improve asthma management in primary care (Premaratne

et al., 1999). However the study was based at the primary care level with a central role for practice nurses; not the doctors. Thus, my study evaluated the role of doctors in improving quality of life in asthmatics.

1.5 Why Asthma Education Should Be Implemented

Asthma Insights and Reality in Asia Pacific (AIRIAP) demonstrated the less than expected results of the current state of patients' knowledge, attitudes and behaviour related to asthma across the Asia Pacific region namely China, Hong Kong, Republic of Korea, Malaysia, Philippines, Singapore, Taiwan and Vietnam. In all the eight countries there were poor knowledge on asthma and its management (GlaxoSmithKline Malaysia, 2000).

AIRIAP-Malaysia was conducted by Isis Research between September and December, 2000 which was commissioned by GlaxoSmithKline in collaboration with the Malaysian Thoracic Society to gain an insight into patient perception and management of asthma in Malaysia (GlaxoSmithKline Malaysia, 2000).

The results of the survey suggested that the current state of asthma in Malaysia falls far short of the goals for long-term asthma management established by the Global Initiative for Asthma (GINA). This survey documents a need for increased patient education about asthma and its management.

The survey revealed insufficient monitoring and treatment of asthma by doctors and

patients. About 66 % of the asthmatics never had a lung function test, 25% never heard of peak flow meter, 85% did not have a written asthma management plan, 71% did not know that the underlying condition could be treated, 72% were not aware that inflammation causes asthma, 90% of asthmatics did not use inhaled corticosteroids; and data on quality of life suggested that asthma is debilitating and dramatically impacts their lives (GlaxoSmithKline Malaysia, 2000).

Similarly, various studies conducted by the local doctors noted that there is an increasing need to improve the patients' knowledge by means of educating them. To mention some of the studies were by Ahmad *et al.*, 2003 whereby they looked onto the disease impact and asthmatic patients' insight and concluded that symptom control and some aspect of patient education are still lacking in our local asthmatics.

A study by Lee and Khoo, 2003 reported that the patients' asthma control and follow up have been sub-optimal with an over reliance on relievers and under usage of preventive treatment in those presenting with acute exacerbation at the emergency department. This underscores the need for patient education as well as the doctors.

Loh *et al.*, 2004 studied the metered-dose inhaler (MDI) technique in adult asthmatic patients in Seremban and found that the MDI device was still poorly handled by a large proportion of the patients. Similar findings were also noted in studies by Zainuddin and Sufarlan, 1990; and Liam, 1993 also studied on the knowledge of MDI technique among doctors in teaching hospital in Malaysia and revealed that only 21% of the

doctors in the Department of Medicine were able to handle the device completely correctly.

Fadzil and Norzila, 2002 conducted a study on the parental asthma knowledge and concluded that generally there was inadequate asthma knowledge in parents and more effort should be made to disseminate asthma knowledge to parents. In a nutshell, asthma education must be emphasized as part of asthma management.

The success of an asthma management will be determined by the specificity and suitability of the education activities carried out. Above all, it involves the commitment from both the doctor and patient.

Good communication is essential and structured patient education has been shown to be cost effective. Especially so , if the educational dialogue is founded on open communication between clinician and patient which forms a successful partnership in asthma care. In both our national and international guidelines, the importance of patient education has been stressed. All health professionals need to think of how education may best be incorporated into their patients care. Such care will involve the development of a partnership between health professionals and the patients and the acquisition by patients of skills in self-management, as has been recommended by Stoloff *et al.*, 1997. Thus, asthma education should be the main emphasis in the management of asthma.

1.6 Delivery Of The Asthma Education Activities

Patient education takes extra time, but it does not have to be complicated. Physicians should choose patient education tools themselves to make sure the messages correspond with what they would teach. Printed education materials are often used to augment healthcare professionals' verbal information to patients. Printed materials on asthma is one of the commonest example. Physicians and patients should regard patient education materials as supplemental to direct communication. Indeed, the physicians must resist the temptation to use them as a substitute for direct communication (Smith H. *et al.*, 1998).

Few data were presented about the delivery of a complex health service intervention. Weingarten *et al.*, 2002 suggested that interactive educational methods may be more effective than simple information transfer when implementing asthma education programme.

There are a few important barriers faced by many doctors in trying to have the health education running smoothly. Frequently mentioned barriers were lack of financial and staff resources, inadequate clinical information systems, doctors' heavy workload, compensation not being related to quality of care, and doctors' resistance to change. Doctors' resistance to change and heavy workload are related since overworked doctors fear that change may make things even more difficult. One most common objection to patient education is that it takes time – a precious commodity in today's productivity-

driven practices (Henry, 1998 and Rundall *et al.*, 2002).

1.7 Maintaining The Quality Of Care

Continuity in primary care literature is mainly viewed as the relationship between a single practitioner and a patient that extends beyond specific episodes of illness or disease. Continuity implies a sense of affiliation between patients and their practitioners, often expressed in terms of an implicit contract of loyalty by the patient and clinical responsibility by the provider. The affiliation is sometimes referred to as longitudinality, relational or personal continuity, and it fosters improved communication, trust and a sustained sense of responsibility. And as we know, all types of continuity can contribute to better quality of care (Haggerty *et al.*, 2003).

The results of patient education can be substantial. Good patient education does not simply create patients who are better informed; it can produce trust and a stronger doctor-patient relationship. Research suggests that when doctors help patients understand their health problems and their care, patients are more satisfied with that care and doctors and are more committed to the health care process (Brandi White, 1999).

In view of the issues discussed, this study was designed to focus more on enhancing asthma control by increasing patient education to improve the quality of life. In other words, it was conducted to determine the impact of having specific health education for

asthmatics in improving their quality of life. It was also used to reflect the quality of care in the management of asthmatics. As the clinic (Klinik Rawatan Keluarga, HUSM) was accessible to the general population, the group of asthmatics in this study was probably representative of the heterogenous population of asthmatics seen in the primary care setting.

CHAPTER 2 OBJECTIVES

2.1 General Objective :

To determine the effectiveness of a specific health education in managing asthma in a primary care setting.

2.2 Specific Objective :

To determine the effectiveness of asthma health education in improving quality of life in asthmatic patients.

CHAPTER 3 METHODOLOGY

3.1 Study Design And Area

This is an interventional study on adults with asthma enrolled in Klinik Rawatan Keluarga (KRK), Hospital Universiti Sains Malaysia (HUSM), Kubang Kerian, Kelantan. It was conducted from April, 2004 until end of January, 2005. HUSM is a teaching hospital that caters for the urban and suburban areas of Kota Bharu and the surrounding districts. KRK is similar to an outpatient clinic in districts and serves as a 'gatekeeper' and can be considered as a primary care setting. It is run by the medical officers and post-graduate students under supervision of the lecturers in the Family Medicine Department.

3.2 Study Population

The patients were recruited from the asthmatic patients who attended the clinic for their appointments. A total of 130 asthmatics were enrolled in the study in which they were informed about the purpose of the study, as well as its duration and the chance to be placed in the intervention or a control group; written consent were obtained. The patients who agreed to participate in the study were systematically assigned to one of these groups. Recruitment is by systematic allocation that is, the first patient selected was assigned under the intervention group and the second patient was taken as control and so on.

ie : Intervention group : 1, 3, 5, 7, 9, 11, 13, 15 .....

Control group : 2, 4, 6, 8, 10, 12, 14, 16 .....

This method was chosen because of its simplicity compared to other methods which are more time consuming and require the assistance of many people.

However, only 120 participants completed the study whereas 10 of the asthmatics were withdrawn from the study for not attending the second evaluation.

3.2.1 Inclusion Criteria

The inclusion criteria were patients aged 18 years or older, Malaysians, asthmatics for at least one year and able to read Bahasa Malaysia/English. For those needed changes in their current management, they had to be in good control at least for two or three months before being included in the study.

3.2.2 Exclusion Criteria

The exclusion criteria were those illiterate to Bahasa Malaysia and English, outpatient for admission ie severe asthma; deaf, dumb, blind, mentally handicap, physical disabilities or other disabilities which may affect the health education programme. Others were elderly to minimize overlapping with other significant comorbidities eg congestive cardiac failure or chronic obstructive airway disease and finally smokers more than 20 years to minimize the possibility of chronic obstructive airway disease.

3.3 Sample Size

Sample calculation was determined by the two means (hypothesis) :

$$n = \frac{2\sigma^2 (Z\alpha/2 + Z\beta)^2}{\Delta^2}$$

σ (standard deviation) = 0.215 (Abdulwadud O. *et al.*, 1999)

$z\alpha$ (95% CI) = 1.96

$z\beta$ (power, 80%) = 0.84

Δ (precision) = 10% (0.1) (expert opinion)

$$n = \frac{2(0.215)^2 (1.96 + 0.84)^2}{(0.1)^2}$$

$$n = \frac{2(0.046)(7.84)}{(0.01)} = 9.2(7.84) = 72.13$$

$$\approx 72$$

20% drop out = 14

$\therefore$ n (sample size) = 72 + 14 = 86 $\approx$ 90

= 90 x 2

$\approx$ 180

In view of limited time and difficulty in recruiting patients, a total of 130 asthmatics were recruited and 10 asthmatics from the control group did not turn up for the follow-up which gave the overall participants in the study of 120 asthmatics. Sixty participants were assigned to each group.

3.4 The Intervention Group

The patients assigned to the intervention/educational group were divided into ten subgroups and each subgroup was then scheduled for the initial interactive counseling session and given a set of screening questionnaires (appendices C and D). Those on inhalers were checked on the proper inhaler techniques using a checklist (see appendix E). The initial peak flow measurements were also documented.

The counseling/education programme was actually adopted from the National Asthma Campaign, 2000 (appendix G). Each session lasted about half an hour to 45 minutes and was conducted in the interactive way to boost patients' understanding, participation and discussion.

During each session, the asthmatics received information about the concept of asthma and its management. The information covered signs and symptoms of exacerbation, triggering factors and environmental control, and some notions on relief (bronchodilator) and on preventive (anti-inflammatory) medication. Correct inhaler techniques and the introduction to a treatment plan ie identifying and reducing the factors that trigger asthma attacks, correct use of inhalers and spacers and recognizing the warning signs of asthma episodes were also emphasized. The patients were encouraged to participate, to exchange information and to clarify their doubts about the disease. Reading material (appendix H) was distributed with information about asthma and diary cards (appendix A) were provided with the purpose of improving the perception of asthma symptoms

during the daily routine.

Because the patients had problems in identifying their medication they were encouraged to bring their medications to the clinic visits where the difference between relief and prevention drugs was explained.

The asthmatic health education was given twice. The first health education was given at the initial part during the information on baseline data gathered and was conducted individually. Whereas, the second health education which followed two months after that was done as group counseling.

The quality of life (AQLQ) and peak flow meter were reassessed two months after the second asthmatic health education given.

3.5 The Control Group

The control group followed the routine schedule and received the usual standard care given by the clinic, where their next follow-up appointment was determined by the attending doctors according to individual patient needs. They did not receive formal instructions regarding asthma control but they were asked to fill out diary cards. They did not receive MDI training sessions or information about environmental control and early recognition of warning signs of asthma. The control group only received instructions from the consulting doctor. Regarding the use of medication and of the inhaler, they received only a verbal explanation.

Similar to the intervention group, they were also screened initially with the AQLQ and PEFR measured. After a period of four months, they were reassessed using the same questionnaire and again PEFR measurements were documented.

3.6 Outcome Measures

The tools used in the study include the standard asthma diary, questionnaire in determining the quality of life – AQLQ at baseline and post intervention, inhaler technique and PEFR measurement pre- and post-intervention. The PEFR were measured by asking the patients to perform three tests in succession, and the highest value was used for each patient. The predicted values were obtained from a standard reference. The measurements were done at the baseline and after the intervention. The metered dose inhaler (MDI) technique was checked and corrected in accordance with standard techniques (appendix E).

The AQLQ measures problems that adult patients with asthma experience in their daily lives. Patients responded to each question on a 7-point Likert scale and the overall score is the mean of all the items (ie 7=no impairment and 1=maximum impairment). So, for instance; the results from a domain with four items and a domain with eleven items will both be expressed as a score from 1 to 7. The overall quality of life score is estimated from the main score of all the items.

The self-administered asthma quality of life questionnaire (AQLQ) is a 32-question

instrument. The participants were asked to identify their five most important daily activities, and to use these as references in future (ie post-intervention) questionnaire completion.

After the completion of this instrument, items were grouped into four domains: activity limitations (eleven items; Questions 1, 2, 3, 4, 5, 11, 19, 25, 28, 31, 32), symptoms (twelve items; Questions 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 29, 30), emotional function (five items; Questions 7, 13, 15, 21, 27) and exposure to environmental stimuli (four items; Questions 9, 17, 23, 26). Higher total scores implied less impairment, whereas lower scores implied greater impairment.

The value referred to as the Minimal Important Difference (MID) is the difference in score that can be considered clinically meaningful and the MID for the AQLQ has been determined as a change in score of approximately 0.5.

According to the studies done by some researchers, they found that the AQLQ has good measurement properties and that it is valid as both an evaluative and a discriminative instrument (Juniper *et al.*, 1999 and Rowe *et al.*, 1993). It measures the component of asthma most important to patients, and it should be considered for inclusion in all asthma studies. Hence, this study utilized the self-administered Malay version of the AQLQ (AQLQ self-administered validated Malay version, 2001).

Approval to use the AQLQ was granted from Professor Elizabeth Juniper from McMaster University Medical Centre, Hamilton, Ontario, Canada. Those participated in