

**QUALITY OF LIFE COMPARISON BETWEEN
CONTROLLED VERSUS UNCONTROLLED ASTHMA IN
HOSPITAL UNIVERSITI SAINS MALAYSIA, KELANTAN**

BY

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LIST OF ABBREVIATION

ACQ	Asthma Control Questionnaire
ACT	Asthma Control Test
AQLQ	Asthma Quality of Life Questionnaire
COPD	Chronic Obstructive Pulmonary Disease
FEV1	Forced expiratory volume in the first second
GERD	Gastro-oesophageal Reflux Disease
GINA	Global Initiative for Asthma
HUSM	Hospital Universiti Sains Malaysia
OSA	Obstructive Sleep Apnoe
QOL	Quality of Life

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PERBANDINGAN KUALITI HIDUP DI ANTARA PESAKIT ASMA
TERKAWAL DAN TIDAK TERKAWAL DI HOSPITAL UNIVERSITI SAINS
MALAYSIA, KELANTAN

ABSTRAK

Latar Belakang: Penyakit asthma adalah salah satu penyakit paru-paru kronik yang biasa berlaku di seluruh dunia amnya, dan di Malaysia khasnya. Penyakit asthma memberikan kesan kepada kesihatan fizikal, emosi, kehidupan sosial, dan boleh menyebabkan penurunan kadar kualiti hidup pesakit. Asthma yang tidak terkawal, adalah berhubung kait dengan peningkatan kadar kematian, kemerosotan psikososial, ekonomi dan kualiti hidup pesakit asthma. Kajian ini dijalankan untuk melihat perbandingan kualiti hidup antara pesakit asthma yang terkawal dan tidak terkawal.

Metodologi: Kajian ini merupakan kajian lintang yang dijalankan di Hospital Universiti Sains Malaysia, dari bulan November 2021 sehingga Februari 2022. Pesakit yang telah dikenalpasti dan memenuhi kriteria yang ditetapkan, telah melengkapkan borang demografik, borang kaji selidik tahap kawalan asthma dan tahap kualiti hidup mereka. Semua data yang dikutip kemudiannya dianalisa secara deskriptif (*independent t-test* dan *one-way ANOVA*) dan interferensi hubungan Pearson, menggunakan SPSS versi 27.

Keputusan: Untuk kajian ini, sebanyak 158 individu telah disaring dan 134 pesakit telah diambil. Peserta dalam kajian ini berumur antara 18 hingga 80 tahun, dengan purata umur (48.75 ± 14.42). 76.7% peserta adalah perempuan ($n=103$). Daripada kajian ini, didapati sebanyak 53.7% pesakit mengalami obesity ($n=72$). Atopi dilaporkan sebagai komorbid asma yang paling banyak (58%), diikuti oleh GERD (23.1%), OSA (3.7%), gangguan

keresahan (2.25%), kencing manis dan darah tinggi. 47% pesakit mempunyai asma yang tidak terkawal, tanpa mengambil kira faktor jantina. Purata markah ACQ adalah sebanyak (0.95 ± 0.95) . Tiada korelasi antara kawalan asma dan demografi pesakit, kecuali penyakit GERD ($\chi^2 = 0.008$, $df=1$, $p < 0.05$). Jika dibandingkan dengan domain yang lain, skor keseluruhan AQLQ ialah (5.52 ± 0.80) , dengan domain ransangan persekitaran mempunyai purata skor terendah $(4.17, \pm 1.28)$. Kawalan asma dan kualiti hidup mempunyai hubungan negative yang kuat ($r = -.777$, $n = 134$, $p = <0.001$).

Kesimpulan: Kajian menunjukkan terdapatnya hubungan di antara tahap kawalan asthma dan tahap kualiti hidup pesakit asthma ($r = -.777$, $n = 134$, $p = <0.001$). Pesakit yang memiliki tahap kawalan asthma yang baik, juga memiliki kualiti hidup yang baik, dibandingkan dengan pesakit yang dengan tahap asthma yang tidak terkawal ($p < 0.05$).

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ABSTRACT

Background: Asthma is one of the most common chronic lung disease worldwide including in Malaysia. Asthma caused substantial physical, mental, and social impairment, limiting everyday activities. Asthma that is poorly controlled is linked to increased mortality and morbidity, as well as impairments in psychological, economic and quality of life. This study was done to compare Quality of Life in people with controlled and uncontrolled asthma in Hospital Universiti Sains Malaysia.

Methodology: From November 2021 to February 2022T, a cross-sectional study was conducted at Hospital Universiti Sains Malaysia. The Asthma Control Questionnaire and the Asthma Quality of Life Questionnaire will be completed by all patients. All data were analysed with descriptive statistics (independent t-test and one-way ANOVA), and the association between asthma control and quality of life was analysed using Pearson correlation.

Results: For this study, 158 individual were screened, and 134 subjects were recruited. Participants in this study ranged in age from 18 to 80 years old, with a mean age of (48.75 ±14.42). Females made up 76.7% of the participants (n=103). Obesity was found in 53.7% of the patients (n=72). The most commonly reported concomitant conditions are atopies (58%). Other comorbidities, such as GERD (23.1 %), OSA (3.7%), anxiety (2.2%), diabetes, and hypertension were also discovered. Overall, 47 percent of patients had uncontrolled asthma. Overall mean ACQ of (0.95±0.95). There is no

correlation between asthma control and the demographics of the patients, except GERD ($\chi^2 = 0.008$, $df=1$, $p < 0.05$). When compared to other domains, the overall AQLQ mean score was (5.52 ± 0.80), with the environmental stimulation domain having the lowest mean score ($4.17, \pm 1.28$). The asthma control status and quality of life had a strong negative correlation, ($r = -.777$, $n = 134$, $p = <0.001$).

Conclusion: There is a substantial correlation between asthma control status and asthma quality of life status, according to this study. Patients with controlled asthma have a significantly higher quality of life compared to patients with uncontrolled asthma ($p < 0.05$).

1.1 INTRODUCTION

Asthma is a major global health issue, impacting around 358 million people worldwide in 2015. Despite the fact that the global incidence of asthma had declined from 3.9 percent in 1990 to 3.6 percent in 2017, asthma remains the second greatest cause of mortality among chronic respiratory diseases with a total of 0.4 million people dying as a result from asthma^{1,2}. According to the National Health and Morbidity Survey 2011 asthma affects 6.4 percent of Malaysian³.

Asthma is one of the top causes of emergency room visits and hospitalisation, according to studies^{4,5}. As a result, the Global Initiative for Asthma (GINA) suggests that asthma patients be evaluated for asthma management as well as Quality of Life^{6,7}. Despite GINA advice, asthma is commonly poorly controlled⁸, as evidenced by numerous published studies, including those in the Middle East and North Africa (41.5%)⁹, Saudi Arabia (68.1%)¹⁰, Turkey (49%)¹¹ and Italy (51.3%)⁸. In Malaysia, however, there is a scarcity of information about asthma control. An observational cohort study (ASCOPE), including 14 public health clinics in Malaysia is one of the studies. The Global Initiative for Asthma (GINA) Assessment of Symptom Control is used in this study to determine asthma control status. They discovered that out of 1011 patients, 41% had well-controlled asthma, 38% had partly controlled asthma and 21% had uncontrolled asthma¹².

Poorly controlled asthma is linked to considerable psychosocial, economic, and quality of life impairment which affect absenteeism and overall work productivity loss^{5,13,14}, as well as increased asthma morbidity and death^{15,16}. However, assessing asthma control alone does not provide insight into how people with asthma feel about

their social, emotional, and functional well-being on a daily basis^{17,18}. The key outcome for this patient is known as health-related quality of life¹⁷.

In Malaysia, there hasn't been much research done on the quality of life of asthma patients. In a 2014 study by Heethal et. al, they discovered that 24 of 40 patients had a severe quality of life impairment, with the overall mini-AQLQ mean score being (3.9 ± 1.0) ¹⁶. S.E. Ho et.al, observed that asthmatic patients had a moderate degree of quality of life, with a total AQLQ score of (3.79 ± 0.99) ¹⁹, according to a study published in 2011. Participants with self-reported current asthma reported significantly more physically and mentally unhealthy days, as well as more days with activity limitation in the previous 30 days than those who had never had asthma, according to Ford et. al²⁰.

A cross-sectional study in Ethiopia evaluated asthma control and Quality of Life in 184 asthmatic patients discovered a substantial correlation between asthma control and quality of life, with the Mini-AQLQ score improving as asthma control improved. Male gender, intermittent asthma, the use of oral corticosteroids, and the use of SABA have all be linked to poor asthma-related quality of life²¹.

Furthermore, Bourdin et. al, examined the burden and the Quality of Life of uncontrolled and controlled asthma patients in a study. They discovered that patients with uncontrolled asthma (mean ACQ 3.0) had a lower mean AQLQ score (4.24 ± 1.10) than patients with controlled asthma (mean ACQ 0.8) with mean AQLQ score (5.89 ± 0.83) , with p-value of < 0.01 ²².

The impact of uncontrolled asthma on the quality of life should not be underestimated. Patients' quality of life is still an important part of asthma care. However, due to a lack of research on asthma control and quality of life among asthmatic patients in Malaysia, there is a knowledge gap. In Malaysia, there is yet to be a study that compares

the quality of life of those with controlled versus uncontrolled asthma. As a result, the goal of this study is to evaluate the association between asthma-related QoL and asthma control, as well as to compare the QoL in our centre between controlled and uncontrolled asthma.

We use two tools in our research: the Asthma Control Questionnaire (ACQ) and the Asthma Quality of Life Questionnaire (AQLQ). There are seven questions in the original ACQ²³. It asks five key questions, as well as one concerning bronchodilator use, and another about FEV₁% predicted. This study used validated ACQ without FEV₁ % predicted that later called ACQ-6b²⁴. For assessment of AQLQ, this study use a validated standardised Quality of Life Questionnaire (AQLQ (S))²⁵. The original AQLQ contains 32 items, five of which are activity questions chosen by patients²⁶. The five generic activities were replaced by five patient-specific activities in the AQLQ(S)²⁵. We anticipate our research will contribute to a better understanding of asthma control and the effect on quality of life.

1.2 METHODOLOGY

This was a cross-sectional study, which was done in Hospital Universiti Sains Malaysia (HUSM), Kelantan, involving asthma patients who were being followed up at the Pulmonology Clinic, from November 2021 to February 2022. Patients who met the inclusion and exclusion criteria were found after screening. The following are the requirements for inclusion: aged 18 years and up who had an asthma diagnosis which was confirmed by physician. Patients with other respiratory disease such as asthma-COPD overlap, COPD, lung fibrosis, or interstitial disease. Patients with other chronic conditions that would impair their quality of life, such as chronic liver disease, heart failure, or chronic kidney disease were also excluded. Baseline demographic data were collected for all of the patients who were included. After that, the patient completed the Asthma Control Questionnaire and Asthma Quality of Life Questionnaire, either on their own or interviewed by the investigator.

Assessment of asthma control

The Asthma Control Questionnaire (ACQ), a validated Malay version was used to assess asthma control. Juniper et al. designed the ACQ²³, and original author approval was obtained prior to the study (appendix 3.4). The original ACQ had seven questions: five about symptoms and activity limitations, and one question about the use of short-acting bronchodilators. Patients responded to all six questions. The inspector will answer another question with the FEV1% predicted score. This study used the ACQ with six questions, which will be referred to as ACQ-6b in the future. The ACQ-6b is a validated variation of the ACQ that consists of a 6-item measure that excludes the FEV1% predicted from the original seven items²⁴. It also has test-retest reliability Of 0.77. All questions are

graded on a six-point scale from zero to six (0=good control, 6=poor control). All of the items are equal weighted, and the final score is the mean of the six. Uncontrolled asthma is indicated by a mean score of ≥ 0.75 , whereas controlled asthma is indicated by a mean score of < 0.75 .

Assessment of Quality of Life

The Standardised Asthma Quality of Life Questionnaire (AQLQ (S)), which has been validated in Malay, was used to assess asthma quality of life. Juniper et. al established the AQLQ(S) in 1999²⁵, and the study was conducted with the permission of the original authors (appendix 3.4).

The AQLQ(S) is made up of 32 questions divided into 4 domains:

- 1) Symptoms (12 questions): This domain depicts asthma symptoms such as chest tightness and heaviness, shortness of breath, wheezing, coughing, clearing up the throat, trouble breathing out, waking up in the morning or at night with asthma symptoms, sleep disturbance, and sense of fighting for air.
- 2) Activity limitation (11 questions): this section addresses the constraints of various activities, such as difficult activities, moderate activities, social activities, work-related activities, sleep, and overall activities due to asthma. This domain also includes situations or environments that asthma patients must to avoid, such as cigarette smoke, dust, and strong odours or perfumes.
- 3) Emotional function (5 questions): This domain describes emotional dysfunction associated to asthma symptoms such as worry, frustration, and fear.
- 4) Environmental exposure (4 questions) describes how people react to various environmental stimuli such as cigarette smoke, dust, weather/air pollution, and strong odour/fragrance.

The AQLQ (S) was fully validated and is used more often due to its efficiency. Each item is based on a Likert scale of one to seven, with seven indicating no QoL impairment and one indicating the maximum amount of QoL impairment. The mean score for the overall AQLQ score and each domain was computed by summing the scores for each individual item included in it. A score of ≥ 6 indicated no quality of life impairment, whereas a score <6 indicated quality of life impairment.

Statistical analysis

Data was entered into Microsoft Excel 365 version 16.5 (Microsoft, Mexico, US). IBM SPSS Statistics for IOS, version 27 was used to export, clean, investigate, and analyse the data (SPSS Inc. Chicago, US). To assess if continuous data is normally distributed, a Kolmogorov-Smirnov test was used. For AQLQ and ACQ score data, the result implies that the null hypothesis must be rejected ($p < 0.001$). As a result, we use skewness and kurtosis to determine the normality of the data. The AQLQ score's Skewness was found to be -1.02 (Figure 1.2.1), indicating a left-skewed distribution. The AQLQ score had a Kurtosis of 1.96, indicating that the distribution was more heavy-tailed than the normal distribution. The Skewness for total ACQ-6b is 1.24 (Figure 1.2.2), and the Kurtosis is 1.21. The AQLQ and ACQ data are normally distributed, as seen by the Skewness and Kurtosis value of less than 2.

Descriptive statistics were used to analyse sociodemographic data, as well as ACQ and AQLQ. Means and Standard Deviation were used to display continuous data with a normal distribution. Categorical data were presented as frequency and percentage.

Variables were dichotomized in the univariate analysis based on control status (controlled and uncontrolled) and the quality of life status (impaired and not impaired). The Independent Sample t-test, Pearson chi-squared test, and Fisher Exact test were used

to assess the different demographic and clinical characteristics of controlled and uncontrolled asthma. To investigate significant differences between the score obtained on the quality of life scales and subscales and asthma control status, a parametric test was used, which is an exploratory bivariate analysis (independent sample t-test). The data met the requirements of the normal distribution of outcome variables in both control and uncontrolled asthma, as well as the equal variance assumptions, hence an Independent sample t-test was utilised. To investigate the association between ACQ and AQLQ, Pearson Correlations was used when the data is normally distributed. A P value <0.05 was deemed significant.

1.3 RESULTS

General characteristics

During their visit to the Respiratory Clinic Hospital Universiti Sains Malaysia, 158 patients were screened, and 134 subjects were recruited for this study. The remaining patients were ineligible and eliminated for a variety of reasons, including being under the age of 18, having the diagnosis of asthma-COPD overlap, COPD, lung fibrosis, or heart failure. The study participants ranged in age from 18 to 80 years old, with a mean age of 48.75(SD $\pm$ 14.42). Females made up the majority of the participants in this study (n=103, 76.9%). Obesity was present in 53.7% of patients (n=72). Atopies such as allergic rhinitis or eczema were the most commonly reported comorbid conditions (58%). Other comorbidities, such as GERD (23.1 %), OSA (3.7%), anxiety (2.2%), diabetes, and hypertension are also observed. Tables 1.3.1 and 1.3.2 exhibit the demographic information for this study.

Evaluation of asthma control

Overall, asthma was uncontrolled in 47% of patients without regard to gender, whereas 53% of patients had controlled asthma (Table 1.3.1). The minimum and greatest ACQ score was 0 and 4, respectively, with an overall mean ACQ of 0.95 (SD $\pm$ 0.95). With a p-value of > 0.05 , there is no association between asthma control and the demographics of the patients. Only GERD was a significant comorbidity associated with uncontrolled asthma ($\chi^2 = 0.008$, df =1, $p < 0.05$).

Assessment of Quality of Life

The descriptive statistics for the AQLQ domain, total AQLQ scores, and ACQ scores are shown in the Table 1.3.3. The overall AQLQ mean score was 5.52 (± 0.80), with the environmental stimulation domain having the lowest mean score (4.17, ± 1.28) when compared to other domains. The association between asthma control and quality of life was assessed using Pearson correlation. The asthma control status and quality of life had a strong negative correlation, $r = -.777$, $n = 134$, $p = < 0.001$ (Figure 1.3.1). According to a comparison of patients with controlled and uncontrolled asthma, which are; activity, symptoms, emotional, and environmental domains, patients with controlled asthma had a significantly better quality of life than patients with uncontrolled asthma ($p < 0.05$) in terms of overall AQLQ as well as all four domains (Table 1.3.4).

1.4 DISCUSSION

Asthma management's major goal is to obtain and maintain asthma control. Achieving and maintaining asthma control is critical for improving patients' quality of life, as well as reducing the burden on patients, the risk of exacerbation, long-term airway damage and medication adverse effects⁶. Asthma control is inadequate despite the availability of international and Malaysian recommendations and treatment. This is still a big difficulty for clinicians when it comes to treating asthma patients, as evidence shows asthma is uncontrolled, affecting their quality of life.

The male-to-female ratio in our study population (female, 76.9%) was similar to that reported by M. Adachi et. al ²⁷ and Isa N. et. al ¹² with 62.9% and 72% from total population, respectively. It is well known that women have a higher incidence of asthma in adult patients, whereas boys have an higher prevalence of asthma of asthma in children ²⁸. Women with asthma are three times more likely than man to be hospitalised, and they more likely burdened with mortality. These are the reason why Pignataro et. al referred to asthma as the "Female Lung" in their 2017 article "Asthma and gender: The Female Lung" ²⁹. This disparity in asthma epidemiology can be ascribed to hormonal changes throughout puberty, social and environmental factors, and asthma medication responses ^{28,29}.

In this little study, we discovered that only 53% of patients had asthma under controlled, while 47% were remain uncontrolled. Bourdin et al. published a study in 2019 called Qualas, that compared the burden and quality of life of uncontrolled asthma vs uncontrolled asthma. according to this study, 63% of the 481 patients were uncontrolled, with mean ACQ of 3.0 ²². Sakhamuri et. al examined the risk factors for uncontrolled asthma in 428 patients in four specialty clinics in various specialty health care facilities

across Trinidad and Tobago in 2020, using Asthma Control Test (ACT). They discovered that 72.4% of patients had uncontrolled asthma (ACT score <20) regardless of gender ³⁰. Isa N et. al conducted another prospective study (ASCOPE) in Malaysia in 2020, evaluating asthma control using the GINA Assessment of Symptom Control and adherence to asthma medication. They discovered that, 21% of the 1011 patients had uncontrolled asthma, 38% were partially controlled, and only 41% had controlled asthma¹². We may conclude from these research that asthma management and treatment is still uncontrolled, despite the fact that asthma care experts have updated their guideline.

There was no correlation between age group, gender, race, obesity status, and asthma control status in this study. The only comorbidity linked to poor asthma management and decreased quality of life was GERD. This is in line with a study conducted by Sakhamuri et. al in a Caribbean community, which indicated uncontrolled asthma and poor asthma-related quality of life were linked to hypertension, sleep apnoea, depression, anxiety as well as GERD ³⁰. Obesity and GERD were also linked to poor asthma management in a study published in 2019 by Suresh et.al in South Indian Tertiary Hospital ³¹. Sleep apnoea and obesity have both been linked in studies, however this was not the case in this investigation.

In a study by Sandur V et.al, out of 40 asthmatic patients, 70% were diagnosed as GERD³². Previous studies demonstrate associations of GERD with asthma exacerbations and severity. The proposed mechanisms are due to micro-aspiration of gastric contents causing airway inflammation, respiratory symptoms and lung injury, and vagal nerve stimulation from gastric acid reflux leading to bronchoconstriction and respiratory symptoms³³.

The findings suggest that patients in the respiratory clinic at Hospital Universiti Sains Malaysia had a poor asthma-related quality of life, with a mean total AQLQ of

(5.52 ± 0.80). Patients with controlled asthma had higher mean AQLQ score (5.94 ± 0.48) than those with uncontrolled asthma, indicating a higher Quality of Life. This was in line with research undertaken by Zeru et. al in Ethiopia. They discovered that the overall mini-AQLQ mean score was 4.49 ($SD \pm 1.27$), indicating impaired QoL ²¹. In a study conducted in Trinidad, Zeru et. al discovered that 86% of people have moderate to severely impaired quality of life, which affects both men and women equally. Uncontrolled asthma was also linked to a significant lower quality of life ($p < 0.001$) in this study ²¹. Furthermore, Bourdin et. al discovered that both controlled and uncontrolled asthma patients had decreased quality of life, with uncontrolled asthma patients having a worse quality of life than controlled asthma patients, with mean AQLQ 5.89 and 4.24. respectively ²². According to certain theories, asthmatic patients are more sensitive to environmental stimuli such as dust, smoke, and cold weather.

Asthma has been demonstrated in studies to have a negative impact on a patient's physical, emotional and social well-being. When we compared the severity of impairment in each domain, we discovered that the majority of the patients exhibited limitations in the activity domain and environmental stimuli. Adeniyi conducted a study in South Indian utilising the St George's Respiratory Questionnaire (SGRQ) to examine levels of HRQoL among asthma patients in a semi-urban population of southwestern Nigeria. They discovered that asthma patients scored higher on SGRQ in the symptom and activity domains, indicating that their health status was worse in those subscales ³⁴. Haselkorn et al conducted the type and degree of activity restrictions in a real-world study called REACT (Asthma control and activity limitations: insights from the Real-world Evaluation of Asthma Control and Treatment) in 2010. The activity limitations were further categorized into four which are outdoor activity, physical activity, daily activity, and environmental triggers. Those with uncontrolled asthma were found to have a higher

risk of activity limits in three of four categories (outdoor activities, physical activity, and daily activity) than patients with controlled asthma³⁵

1.5 CONCLUSION, LIMITATIONS AND RECOMMENDATION

In conclusion, level of asthma control is strongly associated with quality of life, in which uncontrolled asthma patients experiencing more impairment than those with controlled asthma. As a result, it is critical for health practitioners to appropriately assess and treat asthmatic patients in order to improve their care and quality of life.

There are several major limitations in this study. First, this study focused on patients from single hospital, thus, it may not reflect the total population in Kelantan. Second, the sample size is small to reflect the quality of life in bronchial asthma in the entire population. So, it is recommended that similar studies are carried out in other Kelantan locations with larger cohort to discover the factors associated with uncontrolled asthma and poor quality of life among asthma patients.

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1.7 TABLES AND FIGURES

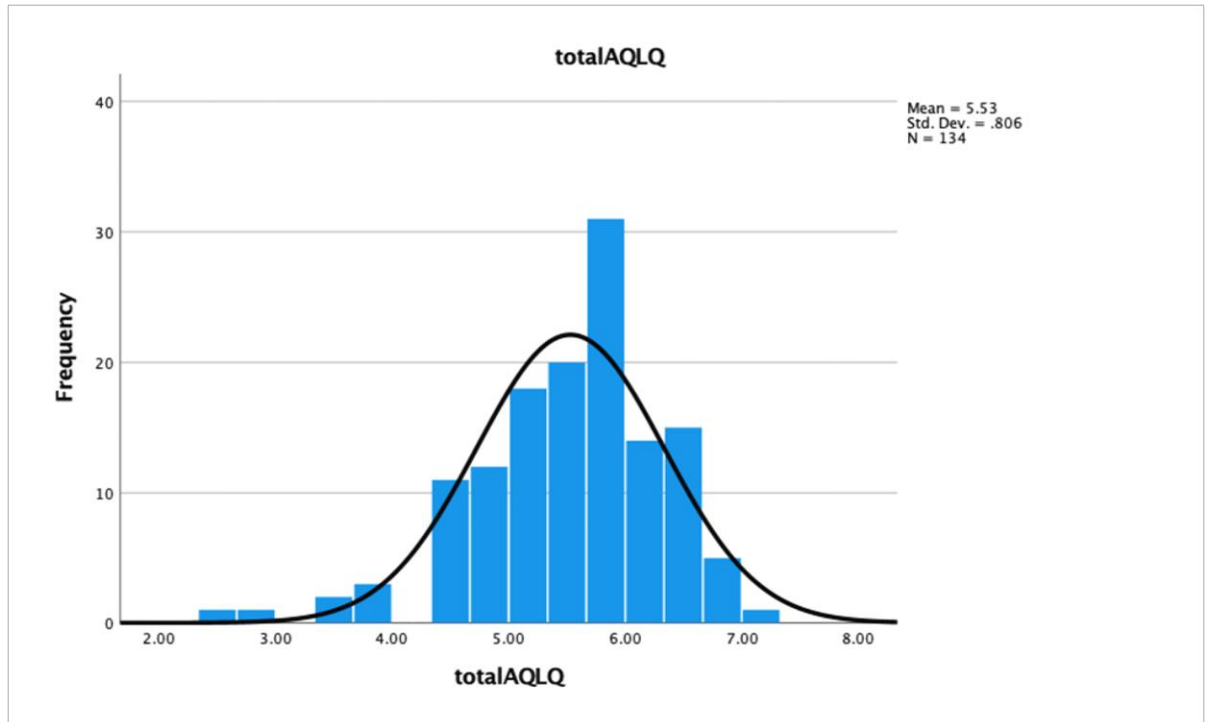


Figure 102.1 Data distribution for AQLQ score.

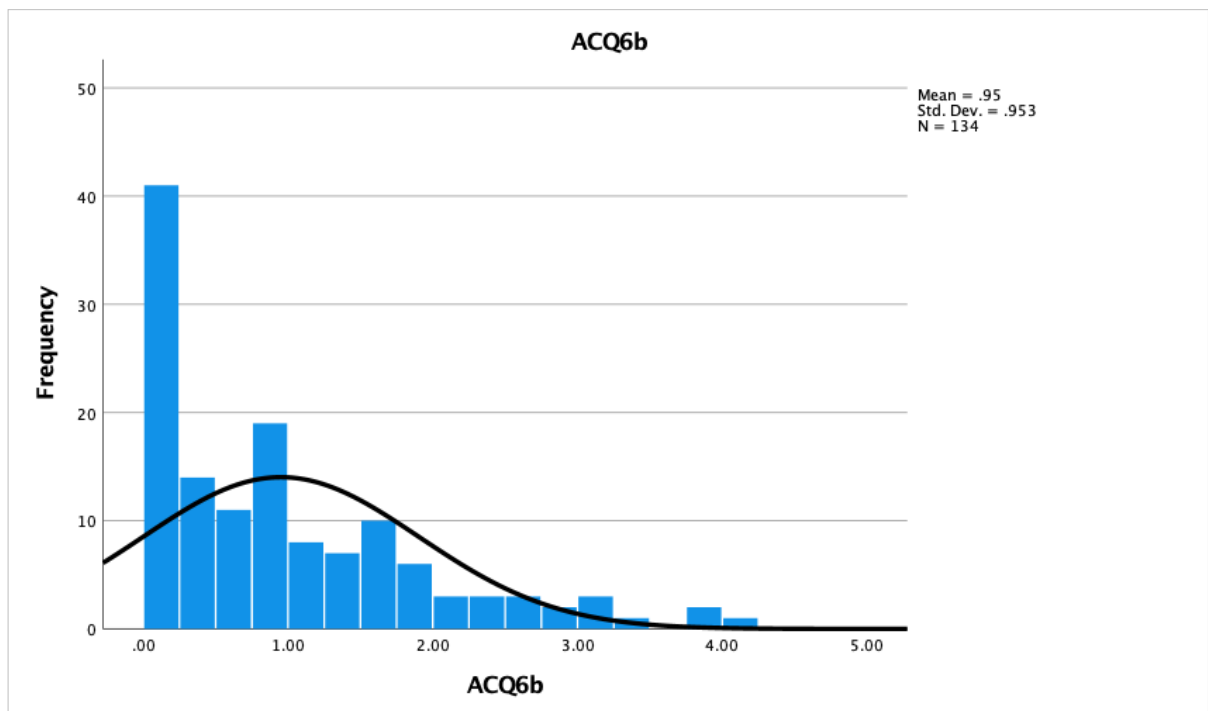


Figure 1.2.3 Data distribution for ACQ score.

Table 1.3.1: Baseline characteristic of the overall population sample for disease control status and quality of life impairment (n=134).

	Total	Asthma control status		Asthma quality of life impairment	
		Controlled n(%)	Uncontrolled n(%)	Not impaired n(%)	impaired n(%)
Total	n=134	71 (53)	63 (47)	35 (26.1)	99 (73.9)
gender					
male	31 (23.1)	17(23.9)	14 (22.2)	11 (31.4)	20 (20.2)
female	103(76.9)	54 (76.1)	49 (77.8)	24 (68.6)	79 (79.8)
Age (years)					
18-25	10 (7.5)	7 (9.9)	3 (4.8)	6 (17.1)	4 (4.0)
26-44	38 (28.2)	20 (28.1)	18 (28.6)	9 (25.7)	29 (29.3)
45-64	66 (49.3)	35 (49.3)	31 (49.2)	16 (45.7)	4 (11.4)
≥65	20 (14.9)	9 (12.7)	11 (14.9)	50(50.5)	16 (16.2)
race					
Malay	128 (95.5)	67 (94.4)	61 (98.8)	34 (97.1)	94 (94.9)
Chinese	6 (4.5)	4 (5.6)	2 (3.2)	1 (2.9)	5 (5.1)
Indian	0(0)	0(0)	0(0)	0(0)	0(0)
Obesity					
Non-obese	62 (46.3)	29 (40.8)	33 (52.4)	17 (48.6)	45 (45.4)
Obese	72 (53.7)	42 (59.2)	30 (47.6)	18 (51.4)	54 (54.5)
comorbid					
Yes	95 (70.9)	46 (65.7)	49 (77.8)	21 (60)	74(75.5)
No	38 (28.4)	24 (34.3)	14 (22.2)	14(40)	24 (24.5)

**Table 1.3.2: comorbid conditions by asthma control and quality of life impairment
(n=134)**

comorbid	Asthma control status			Asthma quality of life impairment		
	Controlled n(%)	Uncontrolled n(%)	p- value	Not impaired n(%)	impaired n(%)	p- value
	n=71	n=63		n=35	n=99	
GERD	10 (32.3)	21 (67.7)	<0.05	2 (6.5)	29(93.5)	<0.05
Allergic rhinitis, eczema	41 (51.9)	38 (48.1)	0.724	20(25.3)	59 (74.7)	0.857
anxiety	1 (33.3)	2 (66.7)	0.917	0 (0.0)	3 (100%)	0.706
Diabetes, hypertension	18 (56.3)	14 (43.8)	0.825	8 (25)	24 (75)	1.0
OSA	3 (66.7)	2 (33.3)	1.00	1 (33.3)	2 (66.7)	1.0

Table 1.3.3: Overall Asthma Quality of Life Questionnaire mean score, individual domain AQLQ mean scores, and overall Asthma Control Questionnaire mean score.

		Mean	SD
AQLQ	Activity limitation	5.24	±0.85
	Symptoms	6.10	±0.90
	Emotional function	5.83	±1.15
	Environmental stimulation	4.17	±1.28
	Overall AQLQ score	5.52	±0.80
ACQ			
	Overall ACQ score	0.95	±0.95

Table 1.3.4: Quality of Life comparison between controlled versus uncontrolled asthma.

	Controlled asthma			Uncontrolled asthma		
	Mean	SD	p value	Mean	SD	p value
overall AQLQ	5.94	±0.48	<0.05	5.07	±0.84	<0.05
Activity domain	5.59	±0.68	<0.05	4.86	±0.87	<0.05
Symptoms domain	6.57	±0.29	<0.05	5.58	±1.06	<0.05
Emotional domain	6.32	±0.59	<0.05	5.28	±1.36	<0.05
Environmental domain	4.5	±1.31	<0.05	3.81	±1.16	<0.05

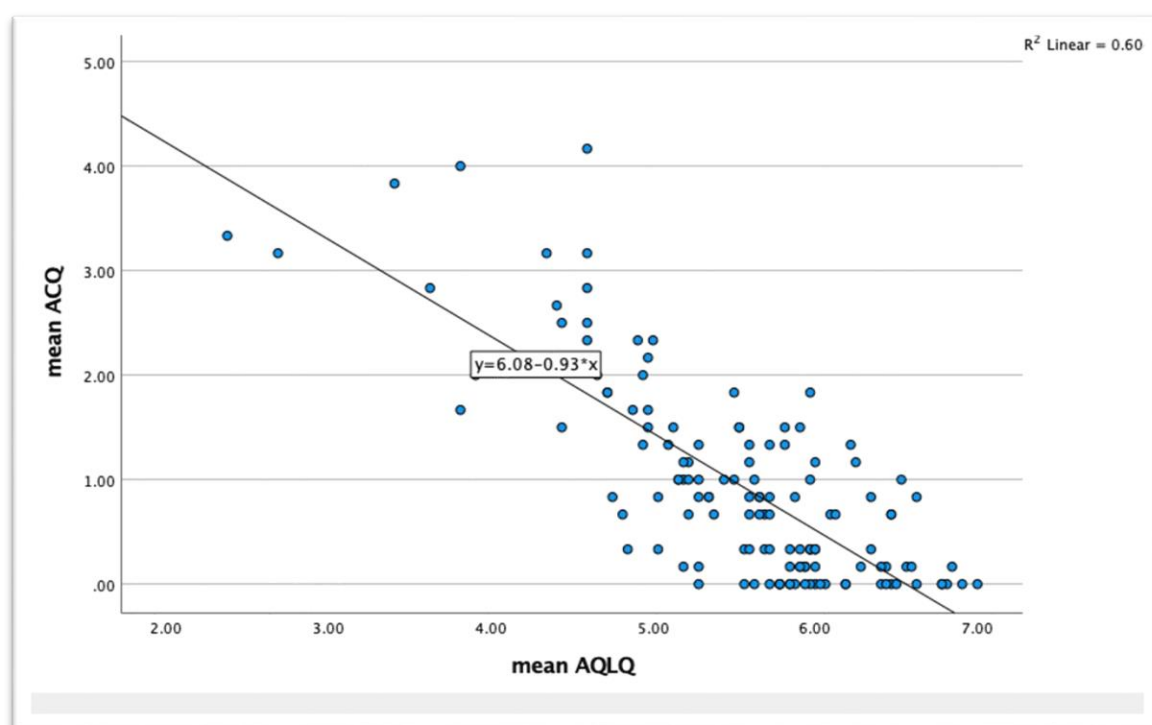


Figure 4.3.1: Correlation between Asthma Control Questionnaire and Asthma Quality of Life Questionnaire scores at Hospital Universiti Sains Malaysia (n=124).

CHAPTER 2: STUDY PROTOCOL

2.1 Study Protocol Submitted For Ethical Approval

1. Introduction

Asthma is a serious global health problem, affecting approximately 358 million people in 2015 globally. Asthma resulted in significant impairment of physical, emotional, social life, hence limitation in daily activities. Global Initiative for Asthma (GINA) recommends that assessment of asthma patients should include asthma control and Quality of Life assessment, besides treatment issue and any comorbidities. Poorly controlled asthma not only associated with increase mortality and morbidity, but also impaired on psychosocial, economy and quality of life of patients^{1,2} However, despite this recommendation, many studies have shown that asthma is frequently poorly controlled. A study that was conducted in the Middle East and North Africa, involving 7179 asthma patients, founds that, 41.5% had uncontrolled asthma, with mean ACT of 17.8³. This study is aimed to determine relationship between asthma-related QoL and level of asthma control as well as comparing the QOL between controlled and uncontrolled asthma.

2. Problem Statement And Study Rationale

Asthma is one of the most common chronic diseases in the world and it affecting approximately 358 million people in 2015 worldwide. An analysis done by Soriano et al for the Global Burden of Disease Study, a total of 0.4 million people died from asthma⁴. From 1990 to 2017, the global prevalence of asthma had decreased from 3.9% to 3.6%, however, asthma still the second leading causes of death among chronic respiratory disease globally⁵. In Malaysia, the National Health and Morbidity Survey 2011 reported a 6.4% prevalence of asthma⁶.

Asthma control, assessed by symptoms, physical findings, inhaler technique and lung function test results, is often used as the basis for treatment decisions in clinical practice⁷. However, such measures alone do not tell us how patients with asthma feel about their social, emotional well-being, and ability to function on a day-to-day basis ^{8,9}. This patient's main outcome is often referred to as health-related quality of life.⁸. In response, assessment of health-related quality of life measures is increasingly being integrated into clinical trials in asthma⁹.

This study is done to increase awareness among medical practitioners regarding importance of treating asthma to improve Quality of Life.

3. Benefits Of The Study

For the institution:

1. Data collections regarding quality of life among asthma patients in Hospital USM.
2. As reference for further clinical research of asthma patients in Hospital USM.

For the health care workers:

1. To increase awareness among medical practitioners regarding the importance of quality of life of asthma patients.
2. To increase awareness among medical practitioner regarding the importance of treating asthma to improve patients' quality of life.

4. Research Questions

Is the Quality of Life poor in the uncontrolled asthma patients?

5. Objectives

5.1 General objectives:

To compare the quality of life among the controlled versus uncontrolled asthma patients in Hospital USM.

5.2 Specific objectives:

1. To compare the mean score of quality of life among controlled & uncontrolled asthma patients in term of overall quality of life.
2. To compare the mean score of quality of life among controlled & uncontrolled asthma patients in term of symptoms domain.
3. To compare the mean score of quality of life among controlled & uncontrolled asthma patients in term of activity limitation domain.
4. To compare the mean score of quality of life among controlled & uncontrolled asthma patients in term of activity environmental stimulation domain.
5. To determine the correlation between asthma control and asthma quality of life.

6. Research Hypothesis

1. Controlled asthma patient has significantly higher overall mean AQLQ score compared to uncontrolled asthma patient.