

Chapter 1:

The relationship between the management and control of asthma in primary health care

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CHAPTER 1

PROBLEM STATEMENT, AIM OF THE STUDY AND RESEARCH METHOD

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CHAPTER 1

1.1 Introduction

“We must not, in trying to think about how we can make a big difference, ignore the small daily differences we can make which, over time, add up to big differences that we often cannot foresee.”

--- Marian Wright Edelman, American Activist 1939-.

Asthma is a commonly known chronic (long-term) heterogenous (Miranda *et al.*, 2004:101) inflammatory condition of the respiratory tract that ravages millions of people worldwide (Van Schayck & Chavannes, 2003:S16), but to understand the basics behind it, the miraculous lung must first be outlined. Exchanging more than 2600 gallons (11819.6 litres) of air per day, through around 300 million blind-ending sacs (alveoli), lined with alveolar epithelium fifty times thinner than tissue paper and a surface coverage as large as a tennis court (Johnson, Faculty of Biological Sciences, University of Leeds), dangers are probing with every breath. Assailants ranging from viruses, pollutants and allergens (Oliwenstein, 2002) trigger the bronchial (airway) tissues to get inflamed, go into spasm and fill up with mucus. This circle of reactions leads to the signs and symptoms asthmatic patients experience: shortness of breath, chest tightness or chest pain, coughing and wheezing (a whistling sound when breathing). Further exposure to allergens or other stimuli, so-called triggers, intensify these symptoms which then would lead to further inflammation of the airways, causing an inability to expel the trapped air from the lungs. This intensified reaction is known as an asthma attack or exacerbation (Rodrigo *et al.*, 2004:1081; Scariati *et al.*, 2006:16).

Asthma diagnoses can be concluded by means of exclusion of other respiratory conditions (pseudo-asthma), such as chronic obstructive pulmonary disease, emphysema and many others, by using a number of breathing-related tests. According to the American Academy of Allergy, Asthma and Immunology (Ceresnak & Lee-Wong, 2008) about 70 per cent of asthmatics have allergy-linked asthma.

There is no cure for asthma (Asthma and Allergy Foundation of America, 2005; Beavitt *et al.*, 2005:1867; Kaplan, 1967:1123; World Health Organization, 2008), but once correctly

diagnosed it is possible to keep the condition well-controlled with various medications as prevention or treatment, on long- or short-term basis (Environmental Protection Agency, 2009). Those who are properly diagnosed, well-educated about all aspects of their illness, properly treated and are compliant are less affected and able to live a full of value life.

Health Care Providers (HCP) may well take a larger part in this multi-faceted play than is acknowledged (American Lung Association, 2007) and therefore demonstration of the small innovations and their impact towards larger transformation is so important.

1.2 Background and Rationale

“getting stuck behind a bad driver

bad driving is not linked to race, gender, age, creed, or weight. you can't tell who is going to be a bad driver in advance and avoid them. that's what makes this problem so dastardly. all that you know is the minute you tell yourself you're making great time, or that you're about to catch that light, or that it's a great day for a relaxing drive, a bad driver will materialize. he or she will swerve directly in front of you (no signal or with the opposite signal blinking), will slow down at every intersection (especially left turns), will drive just erratically enough that you'd have to be a nascar driver to pass them, and will almost definitely be spewing twice as much exhaust as your average dump truck. there is nothing to do here. even if you were driving a james bond car with rocket launchers, the second you'd blow one car up, a worse one would show up. there's an endless supply of these people.”

--- Joe Dude, the 10 most annoying things in everyday life, 4 Oct.2007 (Blognoscopy).

This quote tends to sum up the entire background to the problem, the only difference to the story is, that this story is not about bad driving, but about bad asthma control. Let us take a look at this short but informative story again: Asthma is not directly linked to race, gender, age, creed, or weight, although certain parallels can be drawn (Apostol et al., 2002:168). You cannot tell who is going to be a sufferer in advance although you can make some

predictions and avoid some triggers (World Health Organization, 2002). But the problem stays 'dastardly'. All that you know is that the minute asthma is diagnosed and control starts, another trigger or exacerbation or health care provider-obstacle comes to light. Without any warning it will simply force the patient to 'suffocate'. Yes, it seems as if the 'multi-plexity' of asthma and quality health care is never ending, once one factor has been removed or improved, another jumps to the forefront.

According to guidelines and statistics of The Global Initiative for Asthma [GINA®, 2008(a)], there is likely to be a marked increase in the number of asthmatics worldwide over the next two decades. It is estimated that there may be an additional 100 million persons with asthma by 2025.

The diversity of health care service systems and the variations in the availability of asthma therapies require that recommendations for asthma care be adapted to local conditions throughout the global community. In addition, public health care providers require information about how to effectively manage this chronic disorder, as well as about education methods to develop asthma care services and programmes responsive to the particular needs and circumstances within their countries (Bousquet *et al.*, 2005:551).

International surveys provide direct evidence for suboptimal asthma control in many countries, despite the variations of availability of effective therapies (Stanley & Szeffler, 2008:697). According to Thorsteinsdottir *et al.* (2008:814) failure of health care providers to question and/or document basic clinical information hinder asthma control assessment through inconsistency and varying decisions and practice. It is clear that every effort must be made to encourage health care leaders to develop means to implement effective asthma management programmes including the use of appropriate tools to document and assess success (Bousquet *et al.*, 2005:551). One of the many facets of asthma care should be a goal of excellent asthma control, aimed for by both health care provider and patient, this being reached by means of efficient effective ethical clinical evaluation and notes (Thorsteinsdottir *et al.*, 2008:818). History taking and explicit clinical documentation proved to be on the far background and lead to severely impeded patients, believing to be so-called controlled. The question now would be: What can be done and how?

1.3 Problem statement

“If you want to make enemies, try to change something.”

--- Woodrow T. Wilson (American 28th President of the United States, 1856-1924).

High numbers of asthma patients under the management of primary health care show signs of uncontrolled asthma (Mintz *et al.*, 2009:2523; Stanford *et al.*, 2010:257). According to medical record reviews, clinical documentation is incomplete and inaccurate which results in unreliable resources for medical care (Pourasghar *et al.*, 2008:139). Furthermore, when management of asthma is measured against national and international asthma guidelines, several areas of deficiencies can be highlighted (Diette *et al.*, 2001:59).

This study was motivated by the following factors:

- The increase in numbers of asthma patients irrespective of improving treatment (NAEPP, 2010).
- The alarming high number of uncontrolled asthmatics worldwide (Stanley & Szeffler, 2008:697).
- The high number of patients on asthma treatment without a noted diagnosis (Ross, 2000:1985; Wilson *et al.*, 2005:S21).
- Poor clinic notes regarding patients on asthma treatment.

1.4 Objectives of the research

Objectives were formulated as listed below:

- To evaluate the information obtained and documented, by a public health care provider (HCP) from a patient on asthma treatment, during clinic visits of all three the stages of evaluation.
- To determine whether the diagnosis was clearly documented on patient records (irrespective of correctness).
- To refine / breakdown the examination into trigger factors, allergies, smoking status and important history of the interregnum, plus the documentation thereof.

- To determine whether the necessary control measurements such as peak expiratory flow rates (PEFR) were done.
- To evaluate the prescribed medication: types, appropriateness and dose adjustments (where applicable).
- To determine whether any asthma action/management plans were given to patients/parents/caregivers of asthmatic patients.
- To demonstrate the impact of small interventions towards improved outcomes.
- To determine any contingent relationship between the quality of health care and asthma control and to propose interventions based on the outcomes of the findings in the study, where feasible.

1.5 Significance of the research

Every day millions of people receive primary health care, therefore it is of utmost importance to avow the crucial link between provision of care and its health effects. Quality health care is imperative considering the burden of harm collectively on the health and economic side (Bichara & Goldman, 2009:887; Scariati *et al.*, 2006:16), since improved quality care leads to decreased costs and improved health (Bousquet *et al.*, 2005:551; Chassin *et al.*, 1998:1000). Health care quality often varies and in order to evaluate the quality of care to asthma patients in the district, it is necessary to point out the many facets of variables that may influence the quality and contribute to the complexity of the health care delivery system. Furthermore, it is imperative to revise all 'best quality' possibilities within the provincial set-up. This study has done so with no imputation towards the skill or motivation of health care providers.

The study further aims to eventually establish a health care provider-patient partnership to fulfil the needs of both, by means of evidence-based guidelines. This would entail patient and health care provider education, accurate diagnoses, symptom and trigger identification, as well as disease and therapy management. According to Healthcare South (2001): "Our goal, almost universally met, is that every patient enjoys a completely full life without any limitations. With understanding of the disease process and of the various medications available, patients should be able to meet this goal. Education and record keeping are keys to achieving this goal".

1.6 Assumptions

Assumption is defined as “a proposition that is taken for granted without proof, that means, treated within the context of a discussion as if it were known. It therefore provides a basis for logical reasoning.” Burns and Grove (1997) define assumptions as: “Statements that are taken for granted or are considered true even though they have not been scientifically tested. Assumptions influence the logic of the study, and their recognition leads to more rigorous study development.”

In this study the dominant contextual variable was asthma management and control. The barriers to good asthma control therefore were shortcomings with regard to the disease diagnosis, clinical management, exacerbation prevention, treatment initiation and adjustments, good clinical notes and regular follow-up of patients.

The following assumptions served as departure points for this study:

- A lack of knowledge of asthma on the health care provider's part may negatively influence the diagnosis and management of the patient.
- A system without a continuous educational programme may negatively influence the patient care since protocols change regularly, misdiagnosis happens and inadequate treatment may occur.
- Cryptic clinical notes may lead to improper clinical management and therefore unsatisfactory asthma control.
- Irregularly scheduled follow-up visits of patients may exercise a negative impact on the chances of good asthma control.

1.7 Definitions of key concepts

Key concepts that required clarification for enhancement of the study purpose included the following:

1.7.1 Asthma

Asthma as a chronic incurable but manageable disorder of the airways (lungs) consists of two main components namely: constriction (variable obstruction of airflow and hyper-

responsiveness of the airways) and inflammation (Healthcare South, 2001), causing tightened muscles around the airways, with narrowing of the pathways and swollen irritated mucus producing inner surfaces. These manifestations result in: symptoms such as wheezing, coughing (mainly at night or early mornings), chest tightness, and/or shortness of breath (GINA®, 2008; Nadel & Busse, 1998:S130; World Health Organization, 2002).

17.2 Asthma control

According to Dr.Chipps of the American College of Allergy, Asthma & Immunology (Chipps & O'Hollaren, 2009), the most accurate measures of asthma control are likely to be a composite picture of a given patient, including lung function-measures, symptoms, quality-of-life measures, and possibly a measure of underlying inflammation. This implies the control of the clinical disease as it manifests. The current study focused on the first two measures since doing so is applicable to the milieu as well as cost-effective.

1.7.2.1 Controlled asthma

The global Initiative for Asthma (GINA®, 2007) refers to a patient with controlled asthma as being a patient who demonstrates all of the following:

- No symptoms during the day (≤ 2 per week)
- No activity limitations
- No night symptoms
- No reliever therapy use (≤ 2 per week)
- Normal lung function (PEF)
- No exacerbations

1.7.2.2 Uncontrolled asthma

Partly controlled and uncontrolled asthma were grouped together for the purpose of this study since both of them refer to the presence of limitations, uncontrolled asthma demonstrates more limitations than partly controlled asthma, but both display lung function results below 80% according to the GINA® guidelines (GINA®, 2007).

Partly controlled refers to the presence of any of the points mentioned in controlled asthma, where uncontrolled, refers to the presence of three or more of those features present during any week. Partly controlled reflects exacerbations once or more per year, while one exacerbation a week is an indication of uncontrolled asthma.

17.3 Peak flow

The Working Party of the European Respiratory Society (ERS) (Quanjer *et al.*, 1997:2S) defines peak flow as: “PEF (peak expiratory flow) is the maximum flow achieved during an expiration delivered with maximal force starting from the level of maximal lung inflation”. The measurement of forced expiratory volume in one second (FEV₁), by means of spirometry, correlates well with the results found through peak expiratory flow (PEF) (Dekker *et al.*, 1992:165). This is then a reliable, powerful and economical way of measuring lung function and practical for the use in primary health care clinics. Peak expiratory flow measuring should be performed at each clinic visit or health care provider contact session.

17.4 Peak flow meter

“A peak flow meter is a portable, inexpensive, hand-held device used to measure how air flows from your lungs in one ‘fast blast.’ In other words, the meter measures your ability to push air out of your lungs”, as defined by the American Lung Association (American Lung association, 2009). A person’s level of airflow limitation can then be compared to a normal or predicted value of PEF available in tables derived from measurements of healthy individuals in a population.

17.5 Peak flow meter use

Correct use of the peak flow meter and accurate measuring of the peak expiratory flow rate is of utmost importance (Aït-Khaled *et al.*, 2008:13; Griesel, 1994:81). In order to carry out the test the following equipment is needed:

- A mouthpiece (cardboard: disposable, or plastic: reusable)
- A peak flow meter

For the test to be reliable the health care provider must have the following knowledge, and must be able to teach a patient how to perform it:

- ✓ Attach the mouthpiece of choice or availability to the end of the peak flow meter.
- ✓ Set the marker at zero.
- ✓ A patient must then be in the standing position, hand holding the meter without obstructing the path of the marker, meter held in a horizontal position.
- ✓ Explain to a patient to inhale (“take a deep breath”), place lips around the mouthpiece (sealing it off completely), then exhale with as much force as possible.
- ✓ Record the marker level (litres per minute) / (l/min).
- ✓ Repeat the measurement (total of three times).
- ✓ Document the patient’s PEF in l/min (the highest reading of the three).
- ✓ This documented reading can then be expressed as a percentage of the predicted or normal value on capacity for a person of the same sex, age and height (children measured against height only).

17.5 Provincial clinic

A provincial clinic is a place where services to the public are performed and portrayed through acute and chronic disease management by ways of disease recognition, symptom control and a follow-up service with medication. This creates the opportunity for health care providers to follow a maintenance plan with these patients.

17.6 Wheezing

Wheezing is a high-pitched whistling sound during breathing. It occurs when air flows through narrowed breathing tubes.

1.8 Research design and methodology overview

According to Brink (2008:50), the research design refers to the ‘doing phase’ or the *empirical phase* of the research process. For this study, a *three-stage, non-experimental, quantitative, repeated measures research design* was followed. Hopkins (2000) refers to ‘Quantitative

research' as research that "determine(s) the relationship between one thing (an independent variable) and another (an outcome variable) in a population", while 'Repeated measures' follows a time series without a control group. For this design, the researcher conducted retrospective analysis of medical records. This *systematic* review process allowed data collection from case record files of patients with the *same diagnosis* (asthma) at *each clinic*, allowing the researcher to *identify* common clinical features, treatment patterns, and / or factors influencing prognosis.

<u>Methodology Phases:</u>	
- Selection of:	
i)	Research design
ii)	Study population
iii)	Suitable measuring instruments
- Results:	
i)	Application and analyses
ii)	Summary and presentation
- Results based recommendations	

Table 1.1 Methodology phases

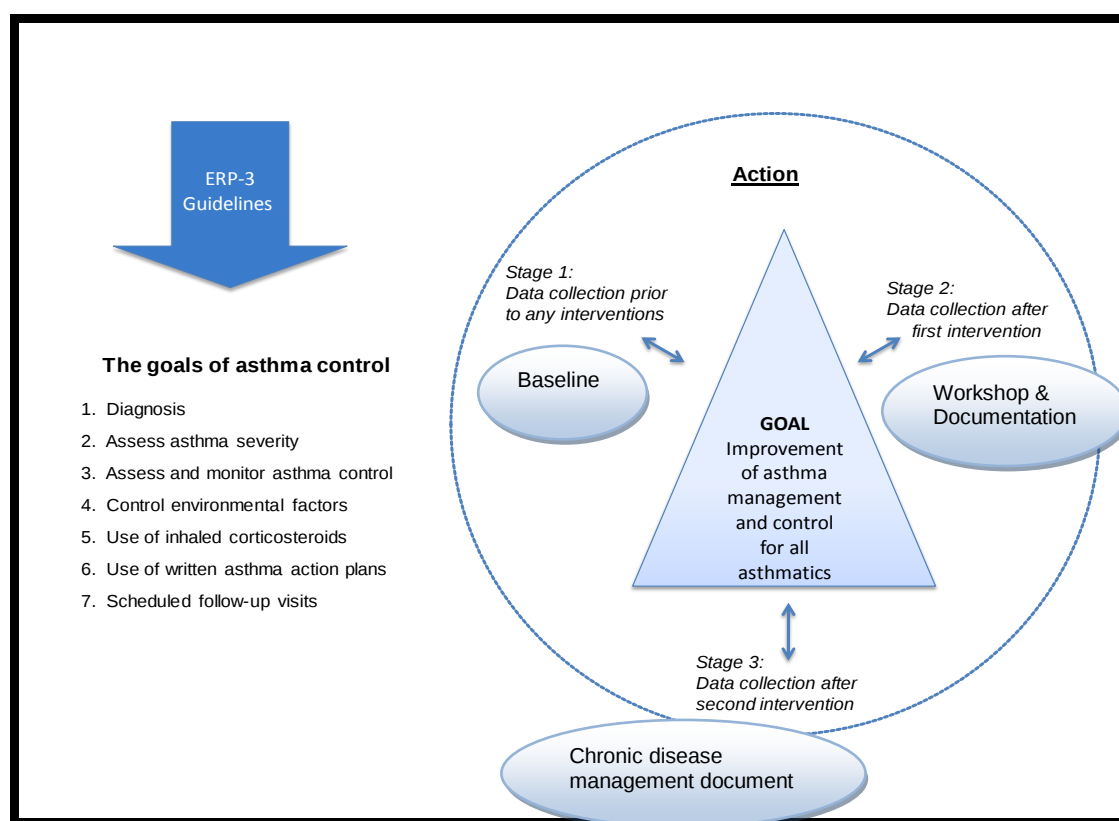


Diagram 1.1 Origin and outline of research

1.8.1 Research Design and Setting

In order to optimise the use of resources and to make the study practical as well as cost-effective, sampling of a population was asked for. Having decided on and spelt out the research problem, the accessible population together with its distinguishing descriptors could be selected. *All asthma sufferers* attending the six *statistically pre-selected* primary health care clinics of Potchefstroom, South Africa, an entity of the Dr Kenneth Kaunda Municipal District, were studied in *three different timeslots of three months each* (May to July 2008, 2009 and 2010).

Out of the eight primary health care clinics of Potchefstroom, the following six were pre-selected with the support of statistical consultation services:

Boiki Tlhapi Clinic (BT)

Lesego Clinic (L)

Mohadin Clinic (M)

Promosa Clinic (P)

Potchefstroom Town Clinic (PT)

Top City Clinic (TC)

A representative sample needs to be as much the same as the entire population. Therefore two primary health care clinics were excluded from the study, due to the fact that they were different from the other six clinics. These two clinics, Boskop Clinic (that only originated at the end of 2006) and Steve Tshwete Clinic, rendered no 'extended hour services' at the point of clinic selection time.

Data-collection must include five important aspects namely:

- ✚ What sort of information is asked for to fulfil the research objectives?
- ✚ What type of instrument will be used to gather the data?
- ✚ Who will be the data collector(s)?
- ✚ What will be the setting for data collection?
- ✚ Exactly when and for how long will the study feature?

Data used in this study were derived from the medical records of all patients that reported at the clinics for *initial or follow-up visits* with the diagnoses of asthma in combination with any

other illnesses or as a single entity. Retrospective and *anonymous* assessments of the records rendered results that aided in the accomplishment of study aims and objectives. Changes in asthma control and management were evaluated through utilisation of a researcher-developed checklist. The checklist was formulated around both national asthma guidelines and The Global Initiative for Asthma [GINA®, 2008(a)] guidelines.

See APPENDIX A

Checklist Scope:	
- Patient code - Date of birth - Age (calculated date: 31 July 2008) - Gender - Clinical documentation of: i. Night symptoms ii. Tightness of chest or chest pain iii. Shortness of breath (SOB) iv. Cough v. Wheezing	- Pulmonary function monitoring: i. Peak expiratory flow reading (PEF) ii. PEF % - Exacerbation prevention: i. Smoker ii. Other illnesses or drugs - Diagnoses - Follow-up date (TCB) - Medication (types according to the steps of asthma management guidelines for primary health care - EDL) i. Salbutamol ii. Beclomethazone iii. Theophylline iv. Prednisone

Table 1.2 Checklist scope

Each of the specific clinics was attended by patients living in the particular surrounding areas. Normal follow-up visits at the clinics were usually scheduled on a monthly basis. All candidates were given the information about the study verbally (health care provider translation -- where possible) and in writing (informed consent forms) and were asked whether they would be willing to volunteer for participation in the clinical study. Candidates were also informed about their right to refuse participation or to withdraw at any time of the study.

See APPENDIX B

Easy follow-up, *per clinic* (or as individual patient), was possible through an anonymous system of coded clinic books e.g., P₁ for Promosa Clinic; patient number one. The principal investigator and two assistants collected the patient records from the specific clinics by signing them out together with a control signature of the health care provider in charge. The record review process was then done by the principal investigator, and records then returned to the specific clinics, following the same procedure as the collection slot.

1.8.2 Study participants

The profiles of the study participants were as follows:

- All asthmatic patients,

in combination with any other illnesses (related or not) or as a single entity.

The targeted ages were all inclusive, males as well as females. Newly diagnosed patients formed a part of the study's scope since the research objectives could as easily be met in these patients. The following were therefore set as inclusion and exclusion criteria:

1.8.2.1 Inclusion criteria

- All asthma patients (including or excluding other contingent illnesses) attending the six pre-selected provincial clinics of the Dr. Kenneth Kaunda Municipal District, Potchefstroom, South Africa
- Newly diagnosed or follow-up patients
- Male and female patients
- Adults and children of all ages
- Smokers as well as non-smokers
- Controlled as well as uncontrolled patients

1.8.2.2 Exclusion criteria

- Subjects who refused informed consent.

Medical records form an inexpensive source of information that allowed assessment of trends over a time-span. The total database as well as study population was compiled from all the medical records (including patient records of all asthma-related or –unrelated visits)

that were collected from the six selected primary health care clinics during the period of May to July 2008, 2009 and 2010.

Year	Study population	Study population per clinic per year (May – July)					
		<u>B</u> <u>T</u>	<u>L</u>	<u>M</u>	<u>P</u>	<u>P</u> <u>T</u>	<u>T</u> <u>C</u>
2008	125	8	28	12	23	20	34
2009	87	2	20	12	26	24	3
2010	111	33	26	5	20	11	16
<i>Total</i>	323	43 (13.3%)	74 (22.9%)	29 (9%)	69 (21.4%)	55 (17%)	53 (16.4%)

Table 1.3 Study population

1.9 Measuring tools

1.9.1 Medical records / Clinic notes

Coded medical records were used to retrospectively review / analyse the following information:

1.9.1.1 Diagnosis

A diagnosis is needed for the correct treatment of a patient. This means ruling out other respiratory conditions, such as chronic obstructive pulmonary disease and emphysema.

1.9.1.2 Peak flow readings

Regular follow-up of peak flow readings are necessary to monitor asthma control and to be able to measure it against a patient's best performance.

1.9.1.3 Symptoms

People can be diagnosed with asthma according to the signs and symptoms they experience, e.g. shortness of breath, chest tightness or chest pain, coughing, wheezing, and night symptoms.

1.9.1.4 Examination

A good basic chest examination will also point out any wheezing that some of the patients might experience but not know about or complain of.

1.9.1.5 Prevention

Exacerbation and mortality prevention include history taking and documentation of smoke exposure, allergen contact, and drugs that can aggravate the symptoms of asthma.

1.9.1.6 Follow-up date

A date for the next clinic visit for follow-up and treatment adjustments is always very important to the control of a patient.

1.9.1.7 Correct management

Determine whether the correct treatment protocol had been used.

19.2 Peak flow

A miniWright peak flow meter was used to assess the peak expiratory flow rate (PEFR) (Griesel, 1994:81). The procedure was performed by the health care provider attending to the patient at that specific day/clinic, as for normal clinic visits.

1.9.3 Asthma control

Control of asthma was measured by means of the results collected from 1.9.1 (Clinic notes / Case record files). Factors included were diagnoses, symptoms, signs, smoking status, 'to-come-back' dates and peak flow readings.

1.10 Data analysis

A non-experimental quantitative, repeated measures study was done on data obtained from the three collection periods. Data analysis was undertaken with the aid of a statistician of the statistical support service of The North-West University (Potchefstroom Campus), using STATISTICA (data analysis software system) version 9.0. StatSoft, Inc. (2009).

www.statsoft.com, after data had been entered into a spreadsheet by an independent data-capturer. Uncomplicated descriptive statistics (frequencies and means), dependent T-tests and two-way frequency tables were used as ways of reporting. Descriptive statistics summarise and transform all the collected data, by means of frequency (number of times that a result occurs) distributions, tendencies and relationships, into an understandable and visually presentable way so that a research report can bring some meaning to the reader.

1.11 Ethical considerations

Retrospective analysis of medical records constitutes a notable part of medical research, and in its turn plays a critical role in medical progress (Menon & Cash, 2006:55). Issues of informed consent and data confidentiality are ethical concerns pertaining to research. For the purpose of the study these primary ethical issues were overcome by means of:

1.1.1. Informed consent

Individual informed consent was obtained from all the participants, or their parent / guardian, before any study-related information was taken from the patient's clinic book. Patients were informed about the study and their right to refuse or to withdraw from the study at any time.

A document informing the patients about the following:

- What their records will be used for
- Who will have access to their records
- How confidentiality will be maintained

These were handed to the patients, and discussed, prior to explicit consent.

See APPENDIX B

1.1.2. Maintaining data confidentiality

Patients are usually willing to participate in research and to support the study once they have been consulted on the use of their record information. The problem around sensitive personal information that might land in the wrong hands makes patients wary (Robling *et al.*, 2004:104). Therefore a study code for the purpose of data analysis was used to ensure confidentiality of information. This way the medical record reviews and the analyses of the data could be done without revealing the patients' identities.

1.1.3. Other important approvals

All forms with regard to ethical and other approval from the relevant authorities, namely the North-West University Research Ethics Committee (Ethics number: NWU-0052-08-S1), the Department of Health (DOH) and the local clinics were completed and approval granted.

See APPENDIX C

1.12 Limitations of the study

Medical records in primary health care clinics are not an accurate reflection of health care provider performance, although drug treatment and special investigations such as peak flow monitoring are more likely to be documented than history taking or physical examinations. The controlled nature of the study, the health care provider education workshop, and the implementation of a guideline-directed, easy to use management document helped to address these limitations.

Findings can only be contextualised due to the fact that the research was conducted in the Potchefstroom setting of the Dr Kenneth Kaunda Municipal District alone. Therefore generalisation of findings is not feasible and conclusions drawn are only relevant to the specific study context.

1.13 Outline of the study

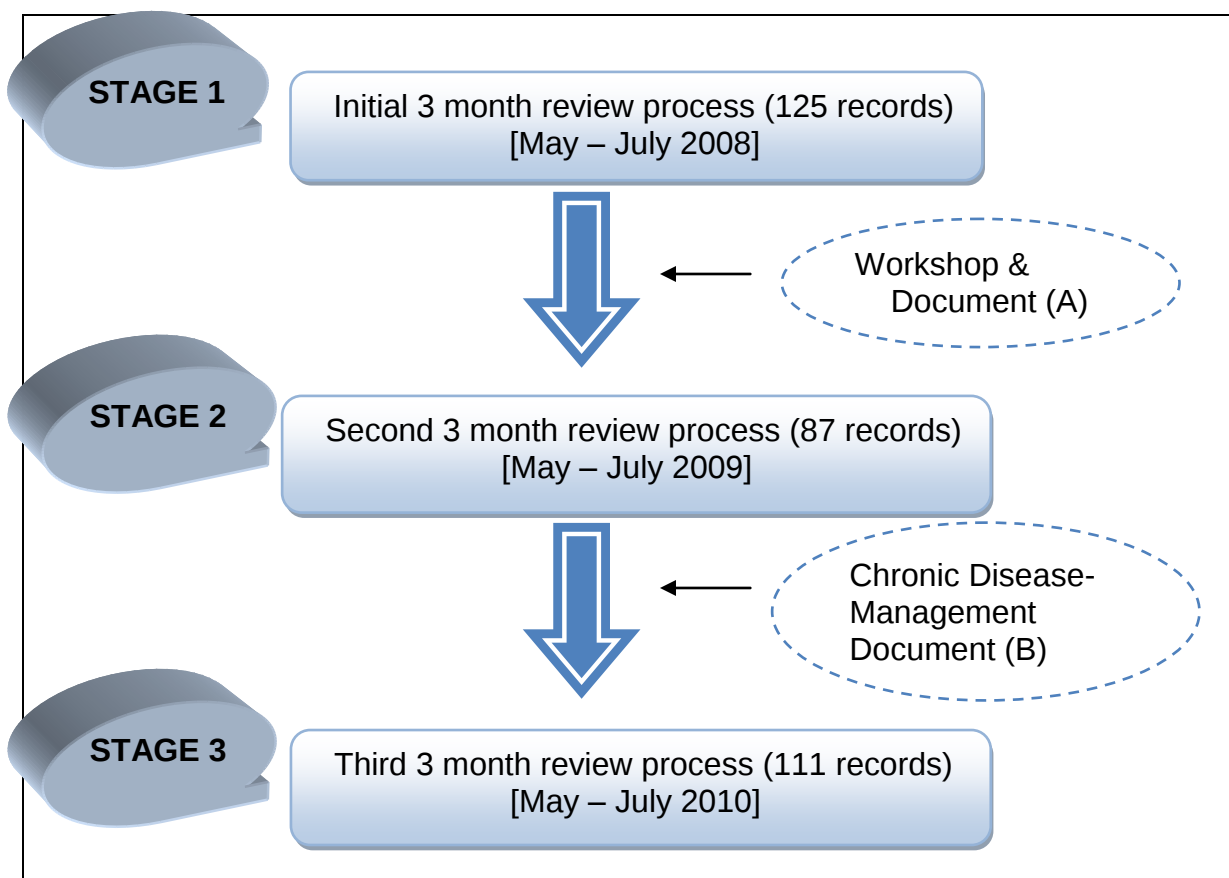


Diagram 1.2 Process and planning

❖ Three-stage / repeated-measures research

Stage 1: Data collection prior to any interventions

Review of medical records without any interventions (retrospective – this forms the baseline values).

Stage 2: Data collection after first intervention

One year subsequent to stage 1 a follow-up medical record review was conducted. This came after a health care provider workshop on asthma management and control had been presented by the principal investigator in conjunction with the Department of Health and the management of the local primary health care clinics in October 2008. During this workshop the health care providers received training and practical exercises to implement a newly invented guideline-directed document (asthma action plan – **See APPENDIX D**). A pre- as well as post-workshop questionnaire was used for the 27 attending health care providers to reflect on their own knowledge and skills, before and after the workshop (**See APPENDIX F**), which resulted in a 28 per cent improvement. Implementation of the action plan was expected to improve outcomes such as management and control of asthma.

Stage 3: Data collection after second intervention

A further year followed before the third review of medical records took place. This time around an improved, *combined chronic disease* management and control document (**See APPENDIX E**) was implemented by November 2009 and the results analysed. This document proposed the ‘idea’ of a patient as a whole, with other chronic conditions that might have an influence on one another, not merely an asthmatic, a diabetic or a hypertensive, but a complex human being (the form did not change much from the first document used during the workshop. It only combined several known chronic disease management documents into one user-friendly document). The document was developed with inputs from all six the clinics, during several follow-up meetings, to ensure that the health care providers (mainly nursing personnel) were familiar with the document. Monthly clinic visits by the principal investigator during January to April 2010 were intended to support and motivate the use of the new document.

❖ Workshop

A health care provider workshop on asthma management and control was presented between the first and the second data collection period.

See APPENDIX F.

❖ Chapters

Chapter 1: Orientation to the study

The reader is introduced to the research topic, namely the relationship between the management and control of asthma in primary health care. The aims and objectives of the study are described and the research design and ethical considerations briefly discussed.

Chapter 2: Literature review

This chapter orientates the reader toward asthma, asthma management, asthma control, and other relevant issues.

Chapter 3: Articles

The published as well as the unpublished work of the researcher is provided in this chapter, together with journal guides to authors, impact factors, and editor comments.

Chapter 4: Conclusions, limitations, recommendations, and reflection of the study

The conclusions drawn from the data analysis, the study limitations, as well as further research recommendations are discussed in this chapter. The researcher also reflects on the aim of the study and the course of the events during the research.

1.14 Summary

An introduction has been given to the many facets of asthma and quality health care. Through assessment of the patient's initial disease, prompt diagnosis, and an evaluation of the patient's ongoing level of control, appropriate medical therapy can be initiated and the level of therapy can be modified based on the patient's response. Good clinical evaluation and documentation are vital in achieving maximal benefit in asthma management. According

to the World Health Organization excellent asthma control is possible and should be a goal of both health care provider (HCP) and patient.

Dr. Leslie Ramsammy, the 61st World Health Assembly's president said: "One of my colleagues, Sir George Alleyne, calls it (the chronic disease burden) the silent tsunami. I have often referred to it as a festering sore" (World Health Organization, 2008). Asthma, more specifically, uncontrolled asthma, accounts for a considerable burden on health and health care systems (Bateman, 2006:1) due to fatigue, reduced activity levels, absenteeism from school and work, and costs, but in most cases, this could have been avoided (World Health Organization(b), 2008). Quality-of-care indicators can aid in monitoring asthma management (Steel *et al.*, 2004).

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APPENDIX A : Data collection document

[illegible]

INFORMED CONSENT FORM

Thank you for agreeing to participate in this study which will take place from 2008 – 2010. This form outlines the purpose of the study and provides a description of your involvement and rights as a participant.

The purpose of this project is:

- To establish the information obtained; and noted; from a patient on asthma treatment during clinic visits, and
- To determine any relationship between health care; clinic notes and asthma control

Patient information will be gathered from the clinic books; no direct contact. Your book will only be recognized by a coded sticker for the follow-up. No patient names will be linked for this project. You get your normal clinic visit.

What is in it for you?

You can in the end expect a better quality of health care and thereby get better asthma control with an improved quality of life.

You are encouraged to ask any questions at any time about the nature of the study and the methods used. Your suggestions and concerns are important; please contact us at any time at the address/phone number listed below.

The information from this study will be used to write a report about asthma; and not about you as a participant.

The following conditions will be met:

- 1) Your name will not be used at any point of information collection, or in the report.
- 2) There will be no direct contact with you, other than your normal clinic visit.
- 3) Your participation in this research is voluntary; you have the right to withdraw at any point of time, for any reason, and without any prejudice, and the information collected; records and reports written will be open for viewing at any time.
- 4) A copy of the report will be handed to your local health care provider/clinic.

I the participant, hereby agree voluntarily to take part in this research survey.

Signed/Confirmed at _____ on _____ 20____

Signature of participant: _____

Or: Representative of participant (parent/guardian): _____

Form completed by: (Signed as witness) Date: (DD/MM/YYYY) _____ / _____ 20____

Witness 1 _____ Witness 2 _____

Signature: _____ Signature: _____

Researcher: Dr.JM du Plessis
North-West University, School of Pharmacy, G16-264
018 299 2204

APPENDIX C : Approvals



NORTH-WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Dr Jesslee Du Plessis

Private Bag X6001, Potchefstroom
South Africa 2520

Tel: (018) 299-4900
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Web: <http://www.nwu.ac.za>

Ethics Committee

Tel +27 18 299 4850
Fax +27 18 293 5329
Email Ethics@nwu.ac.za

21 Oktober 2008

Dear Dr Du Plessis

ETHICS APPROVAL OF PROJECT

The North-West University Ethics Committee (NWU-EC) hereby approves your project as indicated below. This implies that the NWU-EC grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

Project title :															
The relationship between health care and asthma control															
Ethics number:	<table border="1"><tr><td>N</td><td>W</td><td>U</td><td>-</td><td>0</td><td>0</td><td>5</td><td>2</td><td>-</td><td>0</td><td>8</td><td>-</td><td>A</td><td>5</td></tr></table>	N	W	U	-	0	0	5	2	-	0	8	-	A	5
N	W	U	-	0	0	5	2	-	0	8	-	A	5		
Approval: S = Submission; R = Re-Submission; P = Provisional Approval; A = Authorisation															
Approval date: 15 Oktober 2008	Expiry date: 14 Oktober 2013														

Special conditions of the approval (if any): None

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- The project leader (principle investigator) must report in the prescribed format to the NWU-EC:
 - annually (or as otherwise requested) on the progress of the project,
 - without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
- The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the NWU-EC. Would there be deviation from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-EC and new approval received before or on the expiry date.
- In the interest of ethical responsibility the NWU-EC retains the right to:
 - request access to any information or data at any time during the course or after completion of the project;
 - withdraw or postpone approval if:
 - any unethical principles or practices of the project are revealed or suspected,
 - it becomes apparent that any relevant information was withheld from the NWU-EC or that information has been false or misrepresented,
 - the required annual report and reporting of adverse events was not done timely and accurately,
 - new institutional rules, national legislation or international conventions deem it necessary.

The Ethics Committee would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the Ethics Committee for any further enquiries or requests for assistance.

Yours sincerely

Prof MMJ Lowes
(chair NWU Ethics Committee)

Prof J Du Plessis
(Chairman: NWU Ethics Committee: Unit for Drug Research and Development))



Health & Soc Dev

Department:
Health & Social Development
North West Provincial Government
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POLICY, PLANNING & RESEARCH DIRECTORATE

Tel: (018) 387 5780
Fax: 0866 352 751
mosiaher@nwpg.gov.za

TO : The Office of Superintendent- General
North West Department of Health

FROM : Mr K Rabanye
Director: Policy, Planning and Research

DATE : 09 June 2009

SUBJECT : The relationship between health care quality and
asthma control



The above subject matter refers

1. Purpose

To plea for the final approval of a research study to be undertaken in the North West Province, Department of Health.

2. Background

The Principal Investigator Dr J du Plessis of the above mentioned research study has requested permission to undertake the study in the North West Province. The researcher's protocol was reviewed by members of Provincial Health Research Committee.

The reviewers recommended that the investigator be granted approval to continue with the study on condition that she addresses the comments made and submit ethics approval. The comments were addressed as attached and ethics approval granted by the North West University (Potchefstroom Campus) submitted.

3. Aim and Objective

The objective of the study is to establish the information obtained; and noted by a public health care provider from a patient on asthma treatment during clinic visits and determine whether a diagnosis was made and correctly treated.



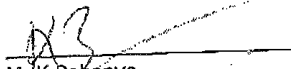
4. Financial Implications

There are no financial implications to the North West Department of Health and Social Development.

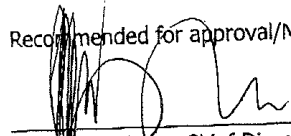
4.1 Specific Action

4.1.1 The Chief Director to further recommend for final approval by the Superintendent General, Dr. L. K. Sebegu.

4.1.2 The Superintendent General to grant approval.


Mr. K. Rabanye
Director: Policy, Planning and Research

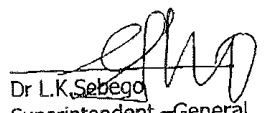
Recommended for approval/~~Not recommended~~


Mr V. W. Mbulawa: Chief Director: Corporate Service
Final approval

Recommended for approval/~~Not recommended~~

Notes :

.....
Granted / ~~Not granted~~


Dr L. K. Sebegu
Superintendent -General
North West Department of Health



HEALTH
Department:
Health
NORTH WEST PROVINCE

4th Floor West End
Building
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27/8/2008

Dear Sir/Madam

This is to confirm that Dr J du Plessis has been part of the asthma quality improvement project currently being implemented in the Dr Kenneth Kaunda district, at clinics and health centres.

Dr C van Deventer

Principal Family Physician, DKK

APPENDIX D : Asthma management document

Chronic patient follow up : ASTHMA						
Name and Surname:					Birth date:	
Clinic no						
Start date				M		
				F		
Date	1	2	3	4	5**	If hypertensive, ude and CVs exam
Medication						
Drs signature						
Qualification						
Peakflow						
Blood pressure						
Daytime symptoms more than 2X per week?						
Y N						
Wheeze						
Y N						
Night symptoms						
Y N						
Smoker						
Y N						
Limited activity						
Y N						
Technique checked						
Y N						
Date dispensed						
Date	1	2	3	4	5**	If hypertensive, ude and CVs exam
Medication						
Drs signature						
Qualification						
Peakflow						
Blood pressure						
Daytime symptoms more than 2X per week?						
Y N						
Wheeze						
Y N						
Night symptoms						
Y N						
smoker						
Y N						
Limited activity						
Y N						
Technique checked						
Y N						
Date dispensed						

APPENDIX E : Chronic disease management document

				Client nr:			
Asthma		COPD		Hypertension			
Epilepsy		Diabetes		Other:			
Name & Surname:				Allergies:			
Clinic no:				Male		Female	
Date of birth:		Length:					
Start date:		Weight:				BMI:	
Date: Seen						Feet,	
Date: Follow-up						Eye	
Medication:		1		2		3	
		4		5		Care	
Drs signature:							
Qualification:							
HCPs signature:							
BP:						U&E,	
Cholesterol level:						&	
Glucose level:						CVS	
						exam.	
PEFR:							
Do you experience any of these: NO / Less than 2X per week / More than 2X per week.							
Wheeze:							
Cough:							
SOB:							
Chest pain:							
Night symptoms:							
Normal activity:							
Technique checked:							
Fits during last month:						Blood	
Drug levels:						levels.	
Urine dipstick:							
Hospitalized:							
Pill count:							
Alcohol:							
Smoker / Snuff:							
Health education:							

Appendix F : Workshop

Workshop:

The principal investigator in conjunction with the Department of Health and the management of the local primary health care clinics presented a health care provider workshop on asthma management and control. This took place on 24 October 2008 and was aimed at all the health care providers of the eight Potchefstroom primary health care clinics, as well as the managers and disease co-ordinators of the Dr Kenneth Kaunda Municipal District.

A total of 27 health care providers completed a pre-workshop questionnaire where after they received skills training and practical exercises on:

- Asthma diagnosis
- Pulmonary function monitoring (PEF measuring and interpreting)
- Checking the technique of inhaler use
- The make and use of spacers
- Asthma management, and
- The implementation and filling-in of the chronic form (a newly invented guideline-directed document to serve as an asthma action plan).

The workshop was wrapped up by a post-workshop questionnaire as part of self-evaluation. The health care providers' clinical skills were also evaluated informally through clinical group presentations and demonstrations.

The 2 questionnaires used as pre- and post-workshop evaluations follows.

Health Care Provider: Self-evaluation

This form is used for each participant to evaluate themselves on before the asthma workshop. The information on this form will be used to provide you with on-going support as you treat your asthma patients.

1) Clinic: _____

2) Job title: _____

3) Date: _____

4) Please circle one of the following: (Exclude today)

a. Have you ever received training on asthma management?	Yes / No
b. Have you ever received training on peak flow meter use?	Yes / No
c. Have you ever received training on spacer use?	Yes / No
d. Have you ever received training on inhaler techniques?	Yes / No

5) Please do the following rating on: BEFORE the workshop.

1.	Your knowledge of asthma as a medical condition.	Poor	Adequate	Good	Very Good	Excellent
2.	Your understanding of asthma control	Poor	Adequate	Good	Very Good	Excellent
3.	Your understanding of partly / poorly controlled asthma	Poor	Adequate	Good	Very Good	Excellent
4.	Your understanding of COPD management	Poor	Adequate	Good	Very Good	Excellent
5.	Your understanding of asthma triggers	Poor	Adequate	Good	Very Good	Excellent
6.	Your understanding of patient information documentation	Poor	Adequate	Good	Very Good	Excellent
7.	Your comfort with peakflows / inhaler techniques / spacer use	Poor	Adequate	Good	Very Good	Excellent
8.	Your ability to distinguish between asthma and COPD	Poor	Adequate	Good	Very Good	Excellent
9.	Your ability to correctly diagnose asthma	Poor	Adequate	Good	Very Good	Excellent
10.	Your ability to document patient information accurately	Poor	Adequate	Good	Very Good	Excellent
11.	Your familiarity with patient self-management plans	Poor	Adequate	Good	Very Good	Excellent
12.	Your familiarity with treatment management and step-ups.	Poor	Adequate	Good	Very Good	Excellent

Health Care Provider: Self-evaluation

This form is used for each participant to evaluate themselves on completion of the workshop. The information on this form will be used to provide you with on-going support as you treat your asthma patients.

1) Clinic: _____

2) Job title: _____

3) Date: _____

4) Please do the following rating: NOW, at the end of the workshop.

1.	Your knowledge of asthma as a medical condition.	Poor	Adequate	Good	Very Good	Excellent
2.	Your understanding of asthma control	Poor	Adequate	Good	Very Good	Excellent
3.	Your understanding of partly / poorly controlled asthma	Poor	Adequate	Good	Very Good	Excellent
4.	Your understanding of COPD management	Poor	Adequate	Good	Very Good	Excellent
5.	Your understanding of asthma triggers	Poor	Adequate	Good	Very Good	Excellent
6.	Your understanding of patient information documentation	Poor	Adequate	Good	Very Good	Excellent
7.	Your comfort with peakflows / inhaler techniques / spacer use	Poor	Adequate	Good	Very Good	Excellent
8.	Your ability to distinguish between asthma and COPD	Poor	Adequate	Good	Very Good	Excellent
9.	Your ability to correctly diagnose asthma	Poor	Adequate	Good	Very Good	Excellent
10.	Your ability to document patient information accurately	Poor	Adequate	Good	Very Good	Excellent
11.	Your familiarity with patient self-management plans	Poor	Adequate	Good	Very Good	Excellent
12.	Your familiarity with treatment management and step-ups.	Poor	Adequate	Good	Very Good	Excellent

5) Please comment on the areas you need to develop the most.

Please turn over...

- 6) Please give an indication of what the educational officers could do to assist you in the areas you listed in the previous paragraph.

- 7) Are there any other matters you would like to bring to the attention of the educational officers? / comments on today's workshop?

Thank you for your honesty, and all the hard work you put into your patient management.

Keep up the good work!

The following results came from these questionnaires:

- The total number of health care providers to complete the questionnaires was: 27
- Of the 27:
 - 11 (41%) received previous asthma management training
 - 18 (67%) received previous peak flow meter use training
 - 12 (44%) received previous spacer use training
 - 17 (63%) received previous training for inhaler techniques
- The following data were on the pre-workshop self-assessment:

Question number	Rated Poor	Rated Adequate	Rated Good	Rated Very Good	Rated Excellent	No Information	Total out of 135	Total %
Number 5.1	1	12	10	4	0	0	71	53
Number 5.2	3	13	9	2	0	0	64	47
Number 5.3	6	13	6	1	0	1	54	40
Number 5.4	8	14	3	2	0	0	53	39
Number 5.5	1	5	18	2	0	1	73	54
Number 5.6	5	15	6	0	0	1	53	39
Number 5.7	4	12	9	2	0	0	63	47
Number 5.8	13	6	6	1	0	1	47	35
Number 5.9	4	15	8	0	0	0	58	43
Number 5.10	3	20	4	0	0	0	55	41
Number 5.11	9	13	5	0	0	0	50	37
Number 5.12	7	15	3	0	0	2	46	34

Table 1.4 Pre-workshop self-assessment

- The following data were on the post-workshop self-assessment:

Question number	Rated Poor	Rated Adequate	Rated Good	Rated Very Good	Rated Excellent	No Information	Total out of 135	Total %
Number 5.1	0	3	9	13	2	0	95	70
Number 5.2	0	1	10	13	3	0	99	73
Number 5.3	0	4	10	9	3	1	89	66
Number 5.4	0	3	11	9	3	1	90	67
Number 5.5	0	2	6	15	4	0	102	76
Number 5.6	0	3	11	10	3	0	94	70
Number 5.7	0	0	9	9	9	0	108	80
Number 5.8	0	2	8	12	4	1	96	71
Number 5.9	0	1	10	12	4	0	100	74
Number 5.10	0	1	13	10	3	0	96	71
Number 5.11	0	3	14	8	2	0	82	61
Number 5.12	0	3	15	6	2	1	79	59

Table 1.5 Post-workshop self-assessment

- Each of the evaluation options that they could chose from were linked to a value, e.g. Poor = 1; Excellent = 5. These totals were then added-up to grant each question a value out of 135 (maximum result if the best mark could be 5 and there were 12 questions).

- The total percentage of each question's improvement, and the overall improvement are demonstrated below:

Question number	Total % Pre-workshop	Total % Post-workshop	% Change per question
Number 5.1	53	70	17
Number 5.2	47	73	26
Number 5.3	40	66	26
Number 5.4	39	67	28
Number 5.5	54	76	22
Number 5.6	39	70	31
Number 5.7	47	80	33
Number 5.8	35	71	36
Number 5.9	43	74	31
Number 5.10	41	71	30
Number 5.11	37	61	24
Number 5.12	34	59	25
Overall Average	42	70	28

Table 1.6 Total percentages per question and overall improvement

This workshop according to health care provider self-evaluation resulted in an overall improvement of asthma management and skills of 28 percent.