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FAMILY PRACTITIONERS PERCEPTION OF, KNOWLEDGE ABOUT AND USE OF PEAK FLOW METERS IN LENASIA, LENASIA SOUTH, AND SOWETO COMMUNITY HEALTH CENTRES

Bhadrish Kantilal Vallabh

A RESEARCH REPORT SUBMITTED TO THE FACULTY OF HEALTH SCIENCES, UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG AS PARTIAL REQUIREMENT FOR THE DEGREE OF MASTER OF FAMILY MEDICINE.

Johannesburg 1998

DECLARATION

I declare that this research report is my own, unaided work. It is being submitted in partial fulfilment for the degree of Master of Family Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other university. This study has received ethical approval from the ethics committee for research on human subjects (medical) at the University of the Witwatersrand.

(Protocol no. m 930914.)

Bhadrish Kantilal Vallabh

1st April 1998

DEDICATION

To U[illegible], Kavita, my parents and all asthma sufferers. May the future hold many new developments to enhance the quality of your lives.

ABSTRACT

This study which measures the extent and determinants of peak flow meter use in the management of asthma, is the first to be performed on the topic among South African family practitioners. The study assessed the utilisation of peak flow meters by family practitioners in three highly urbanised areas; compared the method of utilisation against accepted general guidelines; and it identified the reasons why family practitioners failed to use peak flow meters.

A questionnaire was administered to 92.3% (72 of 78) of private and public sector practitioners working in three urban areas of greater Johannesburg. Data were collected concerning practice profiles, characteristics of the practitioners, the extent of and indications for use, and the reasons for failure to use these meters.

The results showed that only 21 of 72 practitioners (29%) advised their asthmatic patients to use peak flow meters for home monitoring. A scoring system (summary score) which was developed to summarise knowledge of both the indications for the use of meters, and of the method of peak flow measurement showed that only 33,3% of the 72 of practitioners attained maximum or close to maximum scores (6 to 8 of an 8 point scale). University of undergraduate training and the decade of qualification were associated with the summary score. Cost of the peak flow meter was the most important limiting factor to its use.

In conclusion, peak flow meters were under-utilised by family practitioners. Cost of the peak flow meter was an important reported cause of under utilisation. It is recommended that the importance of the peak flow meter in the management of asthma be emphasised at undergraduate and continuing medical education level.

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I am grateful to my wife, Mrs Urvashi Vallabh, my sister Rakhee, Carmen Woodman, Nico van Staden and Melinda Meikle for assisting with this report.

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1. INTRODUCTION

Asthma, a common chronic inflammatory condition of the airways, with large variations in airway calibre over short periods of time, affects about 5 to 10% of the population[1]. In South Africa, in 1988, asthma was recorded as the cause of 2257 deaths[2]. The prevalence of asthma in South African children is between 5 and 10 percent.[3] The management of asthma presents an interesting challenge to the family practitioner who is well placed to offer continuity of care. This is not only of great value for consistent medical care, but also promotes a strong and positive relationship between practitioner and patient, which can be used to encourage the patient's personal management of the illness. Objective measurements of airflow are required to optimise self management and to inform the practitioner of the patient's asthma status[4].

Martin Wright and colleagues first introduced a prototype of a portable peak flow meter in 1959[5]. Instruments to measure airflow had, until that time, been large and cumbersome. Presently, several inexpensive portable devices are available to measure lung function objectively. Stewart has suggested that the peak flow meter, being a relatively robust and inexpensive device, can easily and reliably provide patients and the family practitioner with objective information about changes in pulmonary obstruction. He has also added that an evaluation of peak flow rates can be used to achieve a number of goals in asthma care[6]; These are:-

- To assess the severity of asthma and provide a basis for making decisions with regard to therapy;

- To measure daily variability of peak flow readings as an indicator of the degree of airway responsiveness;
- To determine the severity of an exacerbation and to detect this early before the patient perceives symptoms;
- To allow the patient to adjust doses of drugs to maintain normal function with minimal doses of drugs;
- To identify unknown or suspected trigger factors;
- To identify early critical reduction in peak flow reading which would indicate the necessity of emergency medical care or hospitalisation;
- To assist in the diagnosis of exercise induced asthma;
- To educate the patient about managing his / her asthma;
- To keep airway function close to normal at all times.

The guidelines for the management of asthma in South Africa, drawn up by a working group of the South African Pulmonology Society, state that family practitioners should use peak flow meters routinely in their practices as the morbidity and mortality rates associated with asthma in South Africa are unacceptably high[7]. A relevant understanding of asthma, its treatment and the importance of nocturnal symptoms together with changes in the peak expiratory flow rates are also important aspects of the guidelines. The concept of a self management plan with the assistance of a peak flow meter is strongly emphasised in these guidelines.

Although the peak flow meter has been used in Great Britain since the late 1950's, it came into general use in the United States of America only during the 1970's. The national audit of episodes of asthma in Britain in 1991-2 found that only 29% of patients had their own peak flow meter. Of those who had experienced an asthma episode in the past year only 41% had a self management plan[8].

2. THE OBJECTIVES OF THE STUDY

Since there are no data in South Africa which measure the use of peak flow meters in family practice, and since personal experience suggest its under-use, a study was conducted in a defined population of family practitioners in the Gauteng province.

The study had the following objectives:

- To determine the availability of peak flow meters, perceptions about its usefulness and the perceptions of clinical indications for its use.

- To enumerate reasons why the peak flow meter is not used in general practice.

- To correlate age, sex, university, period of qualification and sector (public or private) with the summary score (which summarises knowledge and use of peak flow meters.)

3. LITERATURE REVIEW

3.1. Instruments used to measure peak expiratory flow

The mini Wright peak flow meter, the Assess, and the Vitalograph are commonly used meters. These three devices provide reliable values for measuring and assessing changes in the peak flow rates of an individual over time.[9]

3.2. Peak flow measurement

Peak flow meters must be accurate to within 10% across the full range of flows, specifically 100-400 litres per minute for children and 100-700 litres per minute for adults. Since there is no readily available calibration system, the patients' current peak flow should be checked on the spirometer (if available) in order to asses the accuracy of the peak flow meter.[10]

The device must initially be reading zero and, either in a standing or sitting position, the patient must breathe in as far as possible i.e. to total lung capacity. Thereafter the patient must place the peak flow meter in his/her mouth, closing the lips around the mouth piece, and must then blow out as hard and as fast as possible for at least 2 seconds, being sure not to cough or let the tongue obstruct the mouth piece. The value obtained must be written down and the process repeated at least twice more. The two highest values should be within 10% of each other, with the highest then being recorded.

The major determinants of peak expiratory flow are:-

i) the force of contraction of expiratory muscles;

ii) recoil forces of the chest wall and lungs;

iii) large airway resistance.

3.3. Limitations of peak flow measurement

The peak flow meter, although useful, has a number of important limitations. The peak expiratory flow rate may be normal when there is obstruction to airflow at lower lung volumes. In addition, the peak expiratory rate determination is a highly effort-dependent test and if performed at home there is no way to assess the intensity of effort or the accuracy of recording. Although the peak flow devices are quite sturdy, they can become colonized with fungal growth.[11]

3.4. The diagnostic use of peak flow meters

3.4.1. Occupational asthma

Occupational asthma is asthma induced by hypersensitivity to an agent encountered at work. The peak flow meter can provide important information by recording readings periodically throughout the day and, if necessary, for a prolonged period.[12]

3.4.2. Exercise-induced asthma

Exercise-induced bronchoconstriction occurs in a large proportion of children with asthma (90%).[13] An exercise test can be done to assist with the diagnosis of asthma. Equipment that is required is simple and easily available: a sidewalk or ergometer bicycle and an inexpensive peak flow meter. An exercise test consists of free running for 6 - 8 minutes. The

effort must be sufficiently intense to make the patient moderately breathless and produce a pulse rate > 160 beats per minute in adults and 180 in children. The peak respiratory flow is measured before and after 1, 5, 10, 15 and 20 minutes exercise. A decrease of ≥ 20% is highly suggestive of asthma.[13]

3.4.3. Responsiveness to bronchodilators

Response to bronchodilators can be used to establish a diagnosis of asthma and to determine the most effective bronchodilator. Responsiveness should first be assessed with a selective B_2 stimulant such as Salbutamol or Terbutaline. This is given as a supervised inhalation of two to four puffs from a standard metered dose inhaler. An increase of 15% in peak flow is generally considered to be significant.[13]

3.5. Clinical uses of the peak flow meter

3.5.1. Appreciation of the severity of asthma

A variation in the peak expiratory flow rate during the course of the day is commonly observed in patients with asthma. It appears that morning dipping of peak expiratory flow rate may have the same significance as nocturnal asthma. Asthmatic patients usually show a difference of at least 15% between mean morning and evening values. The cause of this diurnal variation in airway calibre is not clear, but its documentation by means of recordings from a peak flow meter made at home is a simple way of confirming the diagnosis of asthma.[14]

3.5.2. The acute exacerbation of asthma

Monitoring the peak expiratory flow rate may be useful in the assessment of acute exacerbations of asthma in the emergency room setting. The initial level may be used to determine whether the patient requires further investigations or hospitalisation. The peak expiratory flow rate could also be used to assess response to therapy and to assess the appropriate time to discharge patients from hospital.[15]

3.5.3. The peak flow meter and subjective perception of asthma

There has been interest in the peak flow meter as a means of favourably modifying the often faulty patient perception of pulmonary obstruction. There is evidence that, with regular use of a peak flow meter, patients can learn to estimate accurately their own peak expiratory flow rates, sharpen their awareness of asthma symptoms and modify their use of bronchodilators for relief of symptoms.[15]

3.5.4. Self management plan and the peak flow meter

Home peak flow monitoring can be linked to a detailed management plan for asthma exacerbations. Such a plan can involve guidelines for escalation of therapy, for consultation with the medical practitioners, or for circumstances requiring emergency medical care.[15] The crisis self management plan need to be individualised, based on the experience of each patient.

3.6. The South African perspective on peak flow meters

The South African Childhood Asthma Working Group (SACAWG) convened in February 1994 recommended the use of peak expiratory rates in the following clinical situations:

a. All children (> 5 years) during the initial evaluation and at follow up of asthma

b. Moderate and severe asthmatics to assess their condition at home thus providing some objective evidence of the degree of airway obstruction and improvement (if on therapy).

The Guidelines for management of asthma in adults in South Africa was provided by working groups of the South African Pulmonology Society. The following suggestions regarding the use of the peak flow meters were made[7]:

a. In acute asthma the peak expiratory flow rate could serve as a reliable indicator of severity of airflow obstruction.

b. Patients should use the peak flow meter in self-management of asthma and in managing exacerbations of asthma:- The peak expiratory flow rates could provide warning signs of worsening asthma, and the need to adjust treatment or to seek emergency medical care.

3.7. The extent to which peak flow meters are used locally and in other certain selected countries

3.7.1. Local Studies

A study conducted by Ehrlich and Associates in Mitchells Plain, Cape Town or primary school children found that asthma was under-recognised and under-treated at these schools. Sixty percent of these children had never used a peak flow meter[17].

Another study by L. Roux on the use of inhalers showed that only 38,5% of primary care physicians could demonstrate the three essential steps of using an inhaler[18]. This study clearly showed that doctors needed a well designed training programme demonstrating the use of asthma pumps and other instruments used in asthma care e.g. peak flow meters, nebulizers etc.

3.7.2. Other Countries

In the United Kingdom[20] only 29% of patients had their own peak flow meter. A Northern Ireland[21] study and a South Australian[19] study reported a high percentage of use by family practitioners: 98% and 90.6% respectively.

A study conducted amongst house officers at a teaching hospital in Ghana showed that 63% of the doctors considered the measurement of peak expiratory flow useful to determine the severity of asthma.[22]

4. METHODOLOGY

4.1. The study design:

This is a descriptive study. (The original protocol is included as an addendum to this dissertation.)

4.2. Population and sample

The study population included all family practitioners practising in Lenasia, Lenasia South and the Soweto Community Health Centres. Since all family practitioners form part of the study population, no sampling was done.

4.2.1. Family practitioners

Since there is no official list of family practitioners in South Africa,[23] family practitioners were identified by using a compilation of current lists of private practitioners supplied by:

1. D.S.I (mailing survey company)
2. Fison pharmaceuticals
3. Lancet laboratories, which services most private practitioners in the Witwatersrand region
4. Dr S. Natha: superintendent of the Soweto Community Health Centres.

Lenasia and Lenasia South practices:

The list showed that 45 family practitioners practised in the Lenasia or Lenasia South area.

Soweto Community Health Centres:[24] (SCHC)

At the time of study the SCHC comprised 11 clinics. These clinics were divided into 4 groups, each group having a "mother" clinic with "sister" clinics attached to it.

Table I - Soweto Clinics

Mother Clinics	***Sister Clinics***
1. Koos Beukes	a.) Diepkloof b.) Orlando
2. Mofolo	a.) Meadowlands b.) Phomolong
3. Zola	a.) Tladi b.) Dobsonville
4. Chiawelo	a.) Pimville

A total of 33 family practitioners worked at the clinics and were considered public sector practitioners for the study. Each practitioner consulted approximately fifty patients a day. (An exception was Pimville clinic where the family practitioner consulted approximately forty patients a day.)

4.3. Definition of terms

4.3.1. Peak flow meter (abbreviated to PFM).

An instrument to measure respiratory peak expiratory flow rate.

4.3.2. Peak expiratory flow rate (P.E.F.R).

This is the highest expiratory flow rate measured during the forced vital capacity manoeuvre.

4.3.3. Family practitioner

A medical practitioner practising as a generalist in the public or private sector in South Africa.

4.4. Pilot study

A pilot study was conducted in which the questionnaire was presented to five family practitioners in the Johannesburg/Fordsburg area. This was done in order to check for ambiguities in the questionnaires and problems with presentation etc.

4.5. Measurements and data collection

After obtaining informed consent (Appendix 1), a standardised questionnaire (Appendix 2) was administered to the practitioners by the researcher. Prior consent was obtained from the family practitioner for an interview and an appointment was made. Doctors working in the community health centres were presented with a letter by the superintendent at an in-service meeting. The letter informed practitioners that the survey was to be on the diagnosis and management of asthma in family practice. Peak flow meters were not mentioned to either private or public practitioners as it may have encouraged pre-reading on the subject thus causing bias. Practitioners were also reassured that confidentiality would be respected. The interviews were conducted from the 21 February 1994 to 6 March 1994.

4.5.1. Measurement Instrument

The questionnaire was designed to collect information about:

1. Personal characteristics and education of subjects
2. Clinical experience.
3. Usual method of asthma diagnoses.
4. Use of peak flow meters.
5. Demonstration of peak flow meter by practitioner.
6. Asthma education.

The first series of questions concerned personal characteristics and education. Variables such as age, sex, university where degree was

obtained, date qualified and post graduate qualifications were used to stratify subjects, as these factors might influence peak flow use.

The aim of the clinical experience section of the questionnaire was to ascertain whether or not the practitioner's usage of peak flow meters was influenced by:

1. The number of years in family practice
2. A special interest in asthma
3. Patient load.

The series of questions related to asthma diagnosis were to assess the family practitioner's knowledge of the use of the peak flow meter in the diagnosis and management of asthma. The questions about the peak flow meters were mostly clinical indications for the use of peak flow meters, except for questions 27 and 30 which were included in the questionnaire to assess whether practitioners answered genuinely (i.e. did not answer 'yes' to all questions). Some of the questions focused on whether or not the practitioner prescribed or organised a peak flow meter for patients so that they could monitor their asthma at home. The final series of questions attempted to identify factors which limited the use by family practitioners. The subject was then asked to demonstrate the use of the peak flow meter.

If they did not have the instrument the researcher provided a peak flow meter. The demonstration displayed the subject's familiarity with the peak

flow meter. The final series of questions asked about asthma education and the last question asked whether the subject would wish to attend a workshop/seminar on the use of the peak flow meter.

4.5.2. Method of data analysis

Statistical Method

Questionnaires were coded and double punched to validate data entry.

Summary Scores

To analyse knowledge of indications for the use of meters and the method of measuring peak flow, a scoring system (**summary score**) was derived. Three experienced practitioners compiled the summary score using quite lenient criteria to measure knowledge. To obtain a full score practitioners needed only to:

1) report that peak flow meters were used to diagnose asthma and to assess severity,
2) to know two out of 10 well accepted uses of the meter,
3) to have a meter in his/her consulting rooms and
4) be able to demonstrate the correct use of the meter.

It seems reasonable to say, with some confidence, that doctors who scored poorly lacked knowledge and used the meters less than optimally, and that doctors who scored well had good knowledge and used the meters more

effectively. Since the summary score was used to separate good from poor peak flow meter users, its use as an analytical tool seems appropriate.

Two summary peak flow meter scores were derived so that practitioners could be allocated to usage classes.

The first **summary score** ranged from 0 - 6 and was compiled as follows:

* if the subject volunteered the use of peak expiratory flow rate for the diagnosis of asthma (1 point) question number (18).
* if the peak flow rate was used to assess the severity of bronchospasm (1 point) question number (19).
* if 2 or more responses from the following list (a-j) were volunteered (1 point) question number (24).

a. Keep lung function close to normal.
b. Assess response to treatment.
c. Change treatment.
d. Diagnose exercise induce asthma.
e. Diagnose occupational asthma.
f. Identify trigger factors.
g. Measure severity of asthma.
h. Assess need for hospitalisation.
i. Encourage self management by patient.
j. As an index of airway responsiveness.

* if a peak flow meter could be shown to the researcher during the interview (1 point)
* if correct instructions were given (i.e. To take a deep inspiration, to blow hard and to blow as fast as possible). If 2 or 3 of the above were correct, 1 point was awarded. If only 1 or less was correct, no points were awarded.
* if the subject volunteered that they would take the best of either 2,3, or 4 readings, 1 point was awarded.

The **second summary score** differed from the first in that more points were allocated for correct demonstration of the use of the peak flow meter so that the score ranged from 0 - 8. The score was compiled as for the first summary score except that 3 points were awarded for demonstrating the correct use of the peak flow meter.

* deep inspiration (1 point)
* to blow hard (1 point)
* to blow as fast as possible (1 point)

When comparing the two summary scores, they showed a high degree of agreement: kappa coefficient 0.903 ($P<0.05$). As the two scores were so similar, only summary score two was used in subsequent analysis.

Pie charts are presented to describe age groups of the study population, sex distribution of the family practitioners and university at which basic medical degree was obtained.

Contingency tables were used for:-

- methods to diagnose asthma,
- methods to assess severity of asthma and
- reasons for the limitation of the use of the peak flow meter.

Frequency tables were used for practitioners perception of utility of peak flow measurement, clinical indications to use peak flow meters and patient education time availability.

Descriptive statistics such as the mean and standard deviation were computed for the variables of clinical experience and use of peak flow meters. The mean value with the standard deviation forms a minimally sufficient description of the shape of the distribution of the data presented.

Analytical statistics using the chi-square test and linear regression was used. Bivariate and multivariate analyses were done with the epi-info software program.[25] For bivariate analysis of continuous variables ANOVA was used, and for categorical variables, x^2 tests were done. The relationship between the summary scores and the following variables was investigated:

a. Age group.

b. Sex.

c. Period of qualification.

d. University where degree was obtained

(South African or non South African universities)

e. Sector (private or public).

f. Number of years in family practice.

g. A special interest in asthma.

h. Patient load.

Linear regression was used for multivariate analysis with summary score as the dependent variable and the independent variables were those that were significantly associated with summary score in the bivariate analysis.

4.6. Limitations

- The number of practitioners who took part was relatively small (72) and the study population was confined to one geographical region. To generalise to the rest of the family practitioners in South Africa may therefore be inappropriate.
- The population studied was unusual in that most of the participants qualified outside of South Africa. The population was thus not representative of practitioners working in South Africa. This limitation should be seen in the context of an increasing number of non South African graduates working in the public sector[26].
- The measurement tool was a questionnaire rather than observation of clinical practice. It is possible that practitioners overstated the use of peak flow meters and that, in practice, actual use was less than reported use.
- The scoring system (summary score) has not been used previously, and its validity as a measure of knowledge about peak flow meters has not been tested. Nevertheless, it has fairly strong face validity.

5. RESULTS

5.1. Response rate

There was no sampling from the study population. All of the 78 family practitioners in the study areas were invited to participate and 72 were interviewed. In Lenasia and Lenasia South 41 of the 45 (91%) family practitioners participated. Four family practitioners were not interviewed, the reasons being: not willing to participate, taken ill or extremely busy resulting in failure to set up an interview. At the Soweto Community Health Centres 31 of the 33 practitioners were interviewed, a response rate of 93.9%. Two practitioners could not be interviewed as they were off duty during the interview period.

The overall response rate was 92.3%.

5.2. Demographic data

Age groups of the study population

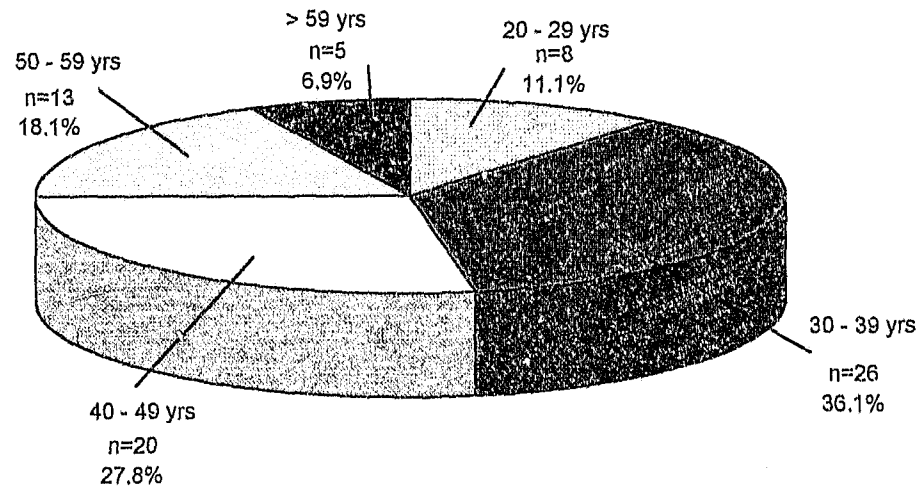


Figure 1 Age groups of the study population (N=72)

Figure 1 shows that more than 60% of the family practitioners were between 30 and 49 years of age.

5.2.1. Sex distribution of the family practitioners

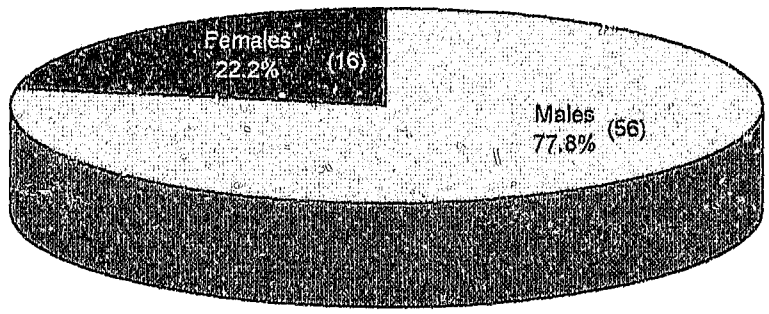


Figure 2. Sex distribution of the family practitioners (N=72)

As seen in Figure 2, seventy eight percent of the practitioners were male (56/72), and 22% female. This gender distribution is similar to that of the South African Medical and Dental Council of 75% : 25% (Gender differentiation based on first names.)

5.2.2. University at which basic medical degree was obtained

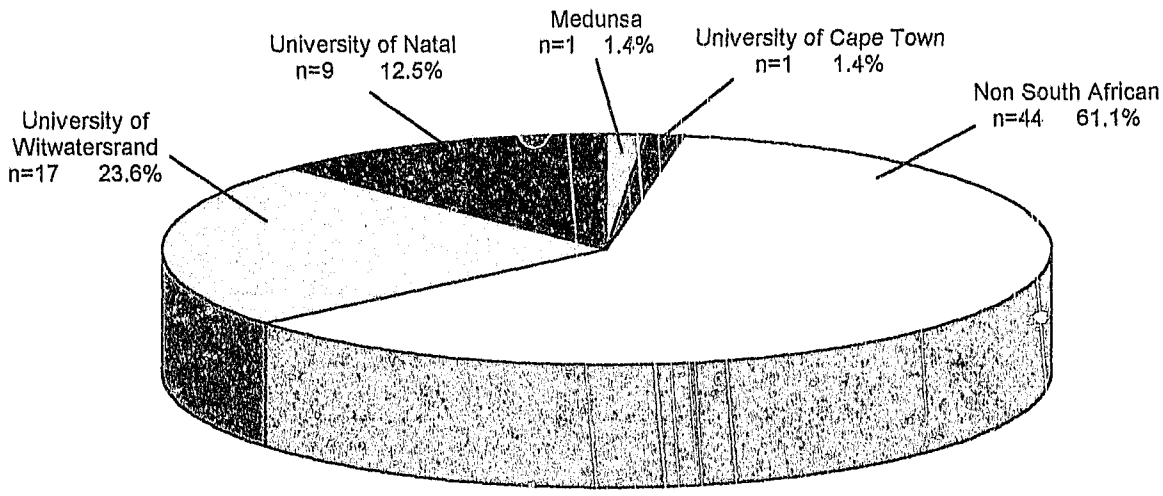


Figure 3. University where basic medical degree was obtained (N=72)

Figure 3 shows that the greater proportion of family practitioners graduated outside South Africa. The majority of the local family practitioners had trained at the University of Witwatersrand.

Twelve of the family practitioners had qualifications in addition to their basic medical degree, of which two were a post graduate qualification in family practice.

Thirty eight family practitioners (53%) qualified before 1980 and 34 (47%) graduated after 1980.

5.3. Clinical experience

Twenty eight practitioners (39%) had practised for less than 6 years. Twenty practitioners (28%) had practised between seven and fourteen years while twenty four practitioners (33%) were in practice between 15 and 39 years.

None of the practitioners had worked in an asthma clinic.

Twelve of the 31 family practitioners in the public sector (39%) reported a special interest in asthma as compared to thirteen of 41 family practitioners (32%) in the private sector.

The family practitioners in the public sector saw between 50 and 500 patients per week (mean:260, SD: 110). The family practitioners in the private sector saw between 40 and 350 patients per week (mean:169, SD:111).

Family practitioners in the public sector saw between one and 70 asthmatics per week (mean:23, SD:18.5) as compared to practitioners in the private sector who saw between one and 30 asthmatics per week (mean: 8, SD:8.2).

Seventy one percent of practitioners in the private sector reported that they had time to attend continuing medical education talks as compared to 45% of the public sector practitioners.

Public sector practitioners had attended between none and seven talks on asthma over the past two years (mean 1.8, SD:1.7) as compared to private sector practitioners who attended between none and twelve talks (mean:2.1, SD:2.6).

5.4. Asthma diagnosis and severity

5.4.1. Asthma diagnosis

Practitioners were asked to state methods used to diagnose asthma. The results are shown in Table II.

TABLE II Methods used to diagnose asthma (N=72)

METHOD OF DIAGNOSIS	PUBLIC SECTOR (n=31)	PRIVATE SECTOR (n=41)
History Taking	93.5% ($^{29}/_{31}$)	97.6% ($^{40}/_{41}$)
PEFR	48.2% ($^{14}/_{31}$)	61% ($^{25}/_{41}$)
Response to B_2 stimulant	6.5% ($^{2}/_{31}$)	17.1% ($^{7}/_{41}$)
X-rays and blood tests	6.5% ($^{2}/_{31}$)	9.8% ($^{4}/_{41}$)
Other lung function tests	0	7.3% ($^{3}/_{41}$)
Refer to specialist	0	2.4% ($^{1}/_{41}$)

Table II shows that more than 90% of practitioners used history taking as a method to diagnose asthma. The peak expiratory flow rate (PEFR) was used by 48% of public sector practitioners as compared to 61% of private sector practitioners ($p = 0.18$). X-rays and blood tests were used by two public sector practitioners and four private sector practitioners for asthma diagnosis. One private sector practitioner felt he would refer his patients to a specialist for a diagnosis of asthma.

5.4.2. Asthma severity

Practitioners were asked to state the methods used to assess the severity of asthma.

The results are shown in Table III.

Table III Methods used to assess the severity of asthma (N=72))

METHODS OF ASSESSING SEVERITY	PUBLIC SECTOR (n=31)	PRIVATE SECTOR (n=41)
Symptoms	90.3% (28)	85.4% (35)
Signs	93.5% (29)	87.8% (36)
PEFR	58.1% (18)	63.4% (26)
Other		1. X-rays (1) 2. Don't know (1) 3. Response to medication (1)

Table III shows that the majority (greater than 80%) of public and private sector practitioners used symptoms and signs to assess the severity of asthma. Peak expiratory flow rates were reportedly used by 58.1% ($^{18}/_{31}$) of public sector practitioners and 63.4% ($^{26}/_{41}$) of private sector practitioners ($p = 0.64$).

5.5. The peak flow meter

5.5.1. Peak flow meter availability

Eighty eight percent of practitioners ($^{63}/_{72}$) reported that a peak flow meter was available in their rooms, however, fifteen practitioners who said they had a peak flow meter failed to show it to the researcher. Six of these practitioners were in the private sector and nine were in the public sector. These practitioners who failed to show the peak flow meter to the researcher, were not awarded a point for their summary score. The impact of this failure to gain a point is shown below:

If a point had been allocated regardless of the failure to show a meter only three practitioners would have changed their summary score groups. The three would have moved from group 1 (score 0 to 2) to group 2 (score 3 to 5).

Private practitioners who failed to show the meter had a mean summary score of 2.67 (SD = 1.5) and the public sector practitioners had a mean score of 2.33 (SD = 2.0). This is in contrast to the practitioners who showed a meter who had higher summary scores. (Private practitioners: mean 5.0, SD = 2.4 and public practitioners mean 4.0, SD = 2.1).

Also notable is that the 15 practitioners who failed to show the meter were unable to adequately demonstrate the correct use of the meter;

Four points were allocated for demonstration and use of the meter. These 6 private practitioners had a mean score of 1.33 (SD = 1.0) out of 4, and the 9 public sector practitioners had a mean score of 1 (SD = 0.71) out of 4. This is in contrast to the practitioners who did show a meter: private practitioners had a mean score of 2.17 (SD = 1.2) and public sector practitioners had a mean score of 1.56 (SD = 1.2) out of 4.

Expectedly, the practitioners who did not show the meter were weak at demonstrating its use. This suggests that they were not unreasonably penalised by not gaining a point.

It should also be remembered that, had they been knowledgeable about and able to adequately demonstrate the use of a peak flow meter, they should have been able to score 7 out of 8 points.

5.5.2. Practitioners perception of usefulness of peak flow measurement

Table IV demonstrates practitioners perception of usefulness of peak flow measurement.

Table IV - Practitioners perception of usefulness of peak flow measurement (N=72)

	Percentage	Frequency
Extremely useful	31%	22
Very useful	18%	13
Useful	37%	27
Not useful	7%	5
Useless	1%	1
Never used	6%	4
	100%	72

Eighty six percent of practitioners answered that the peak flow meter measurement was useful, very useful or extremely useful.

5.5.3. *Clinical indications to use peak flow meters*

Table V demonstrates practitioners reported clinical indications to use peak flow meters.

Table V Clinical indications to use peak flow meters (N=72)

	Frequency		Percentage
1. Diagnose Asthma (N=72)	Yes	39 :	54.2%
	No	33 :	45.8%
2. To assess severity of Asthma (N=72)	Yes	44 :	61.1%
	No	28 :	38.9%
3. For home monitoring (N=72)	Yes	21 :	29.2%
	No	51 :	70.8%
4. Self management plan (N=72)	Yes	51 :	70.8%
	No	18 :	25%
	Unsure	3 :	4.2%
5. To exclude restrictive lung disease (N=72)	Yes	38 :	52.8%
	No	30 :	41.7%
	Don't know	4 :	5.6%
6. Acute exacerbations (N=72)	Yes	60 :	83.3%
	No	10 :	13.9%
	Don't know	2 :	2.8%
7. To change therapy (N=72)	Yes	56 :	77.8%
	No	13 :	18.1%
	Unsure	3 :	4.2%
8. To diagnose exercise induced asthma (N=72)	Yes	48 :	66.7%
	No	21 :	29.2%
	Unsure	3 :	4.2%

Various clinical indications to use peak flow meters are shown in Table V. Peak flow meters were reportedly used to diagnosis asthma by 54.2% of practitioners. A high percentage of practitioners (83.3%) thought peak flow readings were important to document acute exacerbations and 77.7% of practitioners would use peak flow readings to change therapy.

Surprisingly, 70.8% of practitioners thought a peak flow meter would be useful in creating a self management plan for the patient, but only 29.2% of them prescribed or organised a peak flow meter for home monitoring.

Diagnosing exercise induced asthma with a peak flow meter reading was accepted by 48 (66.7%) practitioners.

5.5.4. Reasons for not using a peak flow meter

Practitioners were asked to state the reasons which prevented the use of the peak flow meters in the public and private sectors. The results are shown in Table VI.

Table VI Reasons for limitation of use of the peak flow meter

Reason for limitation of use of peak flow meter	Public (n = 31)	Private (n=41)
1. Cost of PFM	68% (21/31)	61% (25/41)
2. Difficulty in reading of numbers on the peak flow meter	58% (18/31)	34% (14/41)
3. Time available to teach use of peak flow meter	42% (13/31)	34% (14/41)
4. Busy practice	45% (14/31)	24% (10/41)
5. Poor compliance	6.5% (2/31)	27% (11/41)
6. Limit illness = by using a peak flow meter patients would only focus on the reading and treat accordingly.	0%	12.2% (5/41)
7. Laziness (doctor)	3.2% (1/31)	9.6% (4/41)
8. Practitioners would not recommend it	6.5% (2/31)	12.2% (5/41)
9. Administrative (and therefore availability of the meter)	22.6% (7/31)	2.4% (1/41)

When doctors were asked for the reasons which prevented them using the peak flow meter either in their practices or when prescribing them for their patients, the following reasons were mentioned:

Cost of peak flow meter:	Both the public and private practitioners felt that the peak flow meter was expensive for patients to purchase and to use for self management plans at home.
Difficulty in reading of numbers on the peak flow meter:	The practitioners felt that patients would have difficulty in reading the numbers on the peak flow scale, thus limiting its use.
Time availability to teach use of the peak flow meter:	Additional time was required to teach patients how to use peak flow meters. A busy practice therefore was another reason given by practitioners for the limited use of peak flow meters.

The above reasons affected the public sector practitioners more than the private sector practitioners as shown in the table.

5.5.5. Patient education and time availability

Practitioners were asked if time was available to educate patients about their asthma. The results are shown in Table VII.

Table VII Patient education time available (N=72)

Time available	Frequency	%
Always	33	45.8
75% of time	14	19.4
50% of time	18	25
25% of time	3	4.2
Never have time	4	5.6
	72	100

Time was always available for educating asthmatics for 45.8% (33/72) of practitioners.

5.6. Factors associated with summary score

5.6.1. Period of qualification, age group, sex, sector and university

Table VIII shows the association between summary score and period of qualification, age group, sex, sector (public or private) and university.

Table VIII Period of qualification, age group, sex, sector (public or private) and university by summary scores

	Variable (N= 72)		Summary scores		
		n	Mean	SD	p Value
Period of qualification	Before 1980	38	3.5	2.4	
	After 1980	34	4.8	2.1	< 0.05
Age group	20 - 39 years	34	4.9	2.2	
	40 - 49 years	20	3.3	2.6	
	50 - 69 years	18	3.6	2.3	< 0.05
Sex	Males	56	4.3	2.3	
	Females	16	3.5	2.7	0.24
Sector	Private	41	4.6	2.5	
	Public	31	3.5	2.2	< 0.05
University	Non South African	44	3.2	2.3	
	South African	28	5.5	1.9	< 0.05

Table VIII shows that later qualification (after 1980), being younger, being in private practice and qualifying at a South African university were all significantly associated with a higher summary score.

There was no significant association between the sex of the practitioners and summary score (p=0.24)

5.6.2. Years in practice, asthma interest and patient load

Table IX shows number of years in general practice, special interest in asthma and patient load by summary score.

Table IX - Number of years in general practice, special interest in asthma and patient load by summary score.

Summary score				
		Mean	**SD**	**p Value**
Number of years in general practice	1 - 6 years	4.8	2.2	0.25
	7 - 14 years	3.9	2.6	
	15 - 39 years	3.7	2.3	

Summary score group					
		0 - 2	3 - 5	6 - 8	p Value
Special interest in asthma	Yes n=25	5	11	9	0.56
	No n=47	15	17	15	
		20	**28**	**24**	

Patient load per week			
Summary score	Mean	SD	p Value
0 - 2	230	153	0.57
3 - 5	216	109	
6 - 8	179	95	

Table IX shows number of years in general practice, special interest in asthma and patient load by summary score. None of these variables were significantly associated with the score, however it is notable that practitioners who practised for 6 years and less and those who consulted fewer patients per week had higher summary scores; the lack of a significant association may be explained by the small number of subjects.

5.6.3. South African and non South African

Table X shows the South African and non South African qualifiers; they are compared with respect to sector, period of qualification and age group.

Table X **Comparison of practitioners who qualified at South African and non South African universities**

		Non SA (N= 44)	* SA (N = 28)	(N = 72)	CHI^2	p Value
Sector	Private	19	22	41		
	Public	25	6	31	8.62	<0.05
Period of qualification						
Before 1980		25	13	38		
After 1980		19	15	34	0.73	0.39
Age group (years)						
20 - 39		19	15	34		
40 - 49		13	7	20	0.75	0.69
50 - 59		12	6	18		

*** SA = South Africa**

Comparing South African and non South African qualified doctors, with respect to age and period since qualification, there was no significant difference.

Table X shows that a significantly greater proportion of South African qualifiers worked in the private sector (22/28) compared to non South African qualifiers (19/44).

5.6.4. Multivariate Analyses

In Table VIII it can be seen that period of qualification, age group (as a categorical variable with 3 levels of age), sector (private or public) and university (South African or not), were all significantly associated with the summary score ($P < 0.05$).

To determine which of these variables were independent predictors of summary score, multivariate analysis was done using linear regression. Three models (one, two and three) were used. The first had age group, university and sector as independent variables, and the second, period of qualification, university and sector. The third used all four variables in the model. This approach was adopted as age group and period of qualification were likely to be surrogates of each other.

Table XI Model 1 demonstrating the influence of age group, university and sector on summary score

Variable	B Coefficient	Standard error	p Value
Age group	-0.67	0.31	0.05
University (South African/Non South African)	2.03	0.55	< 0.05
Sector (Private/Public)	-0.47	0.55	< 0.05

Table XII Model 2 demonstrating the influence of period of qualification, university and sector on the summary score

Variable	B Coefficient	Standard error	p Value
Period of qualification	-0.67	0.31	0.05
University (South African/Non South African)	2.03	0.55	< 0.05
Sector (Private/Public)	-0.48	0.54	> 0.05

Table XIII Model 3 demonstrating the influence of age group, sector, university and period of qualification on the summary score

Variable	B Coefficient	Standard error	p Value
Age group	-0.26	0.31	> 0.5
Sector	-0.50	0.54	> 0.01
University	2.00	0.55	< 0.05
Period of qualification	0.86	0.82	> 0.1

It can be seen that university was an important variable in all three models, and that in model one, age group was independently associated with summary score. In model 2, period of qualification was associated with summary score (p=0.05)

6. DISCUSSION

6.1. The Study Population

Family practitioners were generally willing to take part: the response rate being 92.3%. The study population was small and only 72 practitioners participated in the study with an unrepresentative proportion of non South African university graduates compared to the general South African population of family practitioners. These practitioners were chosen because of geographical convenience and because it provided, for comparison, private practitioners (Lenasia and Lenasia South) and public sector practitioners (SCHC) in the South West region of Johannesburg.

Sixty percent of family practitioners in the public sector were non South African graduates (25/42). Different languages probably caused communication problems. This factor may influence the practitioners use of the peak flow meter: impaired communication with patients reducing the perceived usefulness.

AGE:

Younger practitioners (20 - 39 years) had higher summary scores (mean 4.9, SD 2.2) than practitioners who were forty years and older. This was statistically significant ($p<0.05$) but may not be generalisable to all family practitioners in South Africa because of factors discussed above.

SEX:

There were more male practitioners than female practitioners. There was no significant association between the sex of the practitioner and his/her ability to use the peak flow meter (p=0.24).

PROFESSIONAL TRAINING

Very few practitioners (3%) had post graduate medical qualifications and most of the family practitioners qualified outside of South Africa (n = 44). The majority of the local graduates trained at the university of Witwatersrand (n=17). The contribution made by other South African universities was small and therefore a comparison of local universities was not done.

The family practitioners who graduated at South African universities had higher summary scores (mean 5.5, SD 1.9) than family practitioners who qualified outside South Africa (mean 3.2, SD = 2.3). This was statistically significant ($p < 0.05$).

Thirty eight family practitioners (53%) qualified before 1980 and 34 (47%) graduated after 1980. The year 1980 was chosen to divide practitioners as the value of the peak flow meter in asthma became increasingly recognised during the 1980's. The number of practitioners who qualified before and after 1980 was fairly equal. The practitioners who qualified after 1980 had higher peak flow usage summary scores (mean 4.8, SD 2.1) compared to those who qualified before 1980 (mean 3.5, SD 2.4). This was statistically significant (p=0.04).

6.2. Clinical experience and use of peak flow meters

The number of years in general practice had little influence on the practitioners use of the peak flow meter (p=0.253). Practitioners who were in practice for under six years had higher summary scores (mean 4.8, SD 2.2) than practitioners who were in practice for greater than 6 years (mean 3.9, SD 2.6). The publishing of the guidelines on asthma in 1992[7] may partly explain this.

Practitioners working in the private sector had higher summary scores (mean 4.6, SD 2.5) than public sector practitioners (mean 3.5, SD 2.5). This was statistically significant ($p < 0.05$). There are a number of factors in the public sector that could have contributed to this difference:

1. The higher proportion of non South African graduates in the public sector (n = 25/31) compared to 19/41 in the private sector. Local graduates preferred to work in academic hospitals rather than SCHS's. There are 25 462 doctors registered in South Africa; as of December 1994, 1 877 have limited registration. These doctors with limited registration provide supervised service in public or state hospitals. The SCHC's, being public sector clinics, have many foreign doctors. Five thousand five hundred of the 10 500 posts in the public sector, are in academic or tertiary hospitals, 5 000 in primary and secondary hospitals. Of the 3 500 doctors working in state hospitals, 1 797 are foreigners and most work in under-serviced areas.[27]

2. The higher patient load per clinic per month in the public sector (mean 259.7, SD = 110.2) compared to the private sector (mean 169.1, SD 111.2). (See table XIV).

Table XIV describes the patient load in SCHC for December 1994.

Table XIV. Patient load at the Soweto Clinics[24]

NAME OF CLINIC	number of patients seen by doctors per month	number of patients seen by sisters per month
Koos Beukes	2350	4780
Diepkloof	1820	4952
Orlando	1075	3081
Mofolo	1339	9315
Meadowlands	1899	4822
Phomolong	1091	3340
Zola	4015	12015
Tladi	1439	3639
Dobsonville	1699	2840
Chiawelo	2913	7424
Pimville	1938	4608

The staff at the SCHCs includes both generalist medical practitioners and primary health care nurses. There are a number of problems experienced by the staff[24].

Soweto's past history of political volatility and violence made it difficult for the public transport system to operate in Soweto. A poor transport system affect patients and doctors who had to be transported to their respective clinics in Soweto to and from Baragwanath hospital. Soweto also has a high rate of vehicles being hijacked.

Poor working conditions e.g. low salaries, minimal fringe benefits, long hours of work in cramped, poorly lit and inadequately ventilated rooms made it difficult for doctors to work in the public sector. It is reported that a high patient load per doctor (see Table XIV) also led to compromised patient care (limited or minimal time for patient education and counselling).

At the time of the study primary health care nurses insisted on seeing not more than 30 patients per day thus leaving the remaining patients for the doctors. This added to the patient load and long hours of work for doctors.[24]

3. Seventy one percent of private practitioners attended continuing medical education talks compared to only 45% of public sector practitioners. Some of the clinics are approximately 50 km away from the teaching hospital thus making it difficult for the clinic doctors to attend continuing medication education talks, ward rounds and updates.

4. Public sector practitioners attended less talks on asthma per year than private sector practitioners: mean = 1.77, SD=1.72 vs mean 2.15 SD = 2.6.

6.3. Asthma diagnosis and severity

The results presented in Table II and III (Page 28 and 29) shows that when practitioners had to volunteer methods used to diagnose and assess the severity of asthma, practitioners considered history taking as the most important source.

Surprisingly, only 45.2% (14/31) of public sector practitioners used the PEFR to diagnose asthma. Some 80 - 90% of asthmatic children will have an abnormal response to exercise, i.e. after exercising for 6 minutes, the fall in the peak expiratory rate is more than 15%. This is widely held to indicate exercise induced asthma[16, 38]. Conversely an increase of 15% in peak flow after the use of a bronchodilator is generally considered to be a significant improvement and therefore suggestive of asthma[16, 28]. Only 6.5% (2/31) of public sector practitioners used the response to a bronchodilator for the diagnosis of asthma as compared to 17.1% of private practice practitioners.

Two practitioners in the public sector and 4 in the private sector suggested the use of x-rays to diagnose asthma. The radiological appearance of the lungs in asymptomatic asthma is normal, and a chest x-ray is primarily indicated to exclude other diseases[29, 37].

Table III summarises the answers received about how these practitioners would assess the severity of asthma. Again, symptoms and signs were used extensively by both public sector and private sector practitioners (90,3% vs 85,4%).

An objective measure such as the peak expiratory flow rate was reportedly used by 58% (18/31) of public sector practitioners and 63.4% (26/41) of the private sector practitioners. The lack of objective measures of severity may be related to a lack of access to the peak flow meter as only 68% (49/72) of practitioners actually showed the peak flow meter to the interviewer. It may also reflect the opinion of the practitioners that peak expiratory flow rates are not necessary in the care of asthmatic patients. This supports the data obtained from practices affiliated to the Ambulatory Sentinel Practice Network in the United States and Canada where there was no record of past peak flow measurement in 55.1% of the encounters[4] between asthma patients and practitioners.

6.4. Knowledge and availability

The major finding of this study was that most general practitioners neither used nor understood the use of peak flow meters in the majority of cases. Even though 85% of practitioners thought that peak flow measurement was useful, only 34.7% (25/72) attained a maximum or close to maximum summary score (6 to 8). Twenty eight percent scored only 0 - 2, thus demonstrating that a substantial proportion had poor knowledge of the use of a peak flow meter. Considering its importance in the care of asthmatics this is of concern. Even though a high percentage (87.5%) of practitioners reported that they had peak flow meters only 68.1% were able to 'show' and demonstrate the use of peak flow meters. In contrast, a Northern Ireland study[21] and a South Australian study [19] reported that 98% and 90.6%, respectively, of family practitioners had a peak flow meter in their consulting rooms. Seventy two percent of practitioners affiliated to the Ambulatory Sentinel Practice Network in the United States and Canada said that they had easy access to peak flow meters[4].

6.4.1. The peak flow meter in clinical situations

The second objective was to assess whether practitioners knew when the peak flow meter should be used in clinical situations. Only 48% of public sector practitioners and 70% of private practitioners volunteered that they used PEFR as a method to diagnose asthma. Similarly 61% of practitioners used a PEFR to assess the severity of asthma.

A study conducted in Ghana amongst first year doctors showed that only 63% of them considered the peak flow measurement useful in assessing the severity of asthma.[22]

Further studies have shown that patients who died of asthma were less likely to have had their peak flow measured in their final illness than controls who survived a severe asthmatic exacerabation[30].

6.4.2. Home monitoring of asthma with Peak Flow Meters

A small percentage of private practitioners (29,2%)got their patients to monitor their asthma at home with a peak flow meter. The proportion was even lower in public practice (16%). These figures are similar to those found in the British National Audit of asthma attacks between 1991 - 1992[20]. A contrasting 59% of asthma patients were monitoring their own peak flow in the Northern Ireland study[21].

Peak flow monitoring is considered fundamental to the concept of asthma self management in South Africa[7] and is emphasised in Australia's, New Zealand's and United States of America's asthma education programmes.[33]

While unequivocal evidence of the relationship between self monitoring and reduced asthma morbidity has not been shown, there is substantive indirect evidence[20].

More than half of the practitioners (52.8%) reported that peak expiratory flow rates could be used to diagnose restrictive lung disease. This question was placed to test the practitioners knowledge of the limitations of the peak flow meter. The hallmarks of the restrictive defect are reduced total lung capacity and forced vital capacity but normal or even increased peak expiratory flow rate.[27] The high proportion of practitioners who felt that restrictive defects could be diagnosed by measuring peak flow suggests a poor understanding of the use of the peak flow meter.

6.4.3. Discussion on why peak flow meters were not used

Cost was the most important factor limiting the practitioners' use of peak flow meters, both in the public and private sectors, (68% of public versus 61% of private practitioners) - compared to only 7% of house officers in Ghana who thought it was expensive.[22] The cost of peak flow meters range from R55 to R150.

An inability by patients to read numbers on the peak flow meter was the second most common limiting factor. This factor was more significant in the public sector. The percentage of illiterate asthma patients presenting to the study practitioners is not known but may be substantial, particularly in the public sector. Soweto's origins and development may have a direct bearing on the health problems and health service. In 1994, Soweto was estimated to have a

population of 1.515 million with an average income of R1 995 per month per household and a literacy rate of 77%.

Limited time and a busy practice were other factors reducing use. Both situations were of more concern to the public sector than the private sector. Running a busy practice influenced practitioners not to issue or recommend the use of a peak flow meter. Time was considered an essential factor as details on the use and documentation of peak flow readings had to be taught.

More private than public practitioners thought compliance would be a problem as patients would not adhere to documenting peak flow readings (27% as compared to 0.06%).

6.5. General discussion

A poor knowledge on the use of the peak flow meter is demonstrated in this study. (See table 3, 4, 6).

There are no previous studies to confirm the above findings, however, a study on whether doctors needed training in the use of aerosol pumps was conducted in Bloemfontein.[18] Only 38.5% of primary care physicians could demonstrate the three essential steps of using an aerosol pump. The peak flow meter and the aerosol pumps are essential components in asthma care. Having insufficient knowledge of the peak flow meter and aerosol pumps could compromise asthma care.

Asthma is under-diagnosed in the community. There is abundant evidence that there is under-diagnosis of asthma by family practitioners. In one study, in which a review of bronchitis patients was undertaken, an average of 16 consultations for respiratory symptoms were needed before a diagnosis of asthma was made.[15] This situation can be improved if testing for asthma is done either with an exercise test or inhalation challenge with the use of a peak flow meter. This would allow the general practitioner to make an early and adequate diagnosis of asthma and promote good asthma care.

Undergraduate university training was an important determinant of the usage of the peak flow meter. Students, in general, are not taught the skills and attitudes required for patient education and to be good managers of resources. Instead, they are asked to do a battery of tests and investigations to rule out 'organic' causes. The unnecessary and inappropriate use of x-rays and blood tests for the diagnosis of asthma can be

replaced by the use of a small, robust and an inexpensive peak flow meter. The peak flow meter is much cheaper than the other investigations and provides more of an objective measure to diagnose and assess the severity of asthma. The latter supports McWinney's principle of family medicine which describes the family physician as the manager of resources.[35] As a generalist and first contact physician, he/she has control of large resources and is able, within certain limits, to control admission to hospitals, limit the use of unnecessary investigations, prescribe appropriately and refer to specialists if the need arises. Acquiring additional knowledge on the peak flow meter at undergraduate level will certainly assist practitioners to fulfil their role as a manager of asthma resources.

The South African asthma working group (adults and children) introduced guidelines on asthma in 1994 which encouraged the use of peak flow meters. These guidelines were widely distributed. Despite this, as this study shows, older practitioners and those qualified before 1980 were less likely to use peak flow meters and were less knowledgeable than their younger more recently qualified colleagues, presumably because they had had less exposure to the peak flow meter during undergraduate training. This suggests that continuing education programmes such as those provided by asthma working groups, departments of family medicine and academic associations of family practice, are necessary to encourage practitioners to adopt practices not learnt while at medical school.

The family physician is ideally placed to offer continuity of care. Asthma is a chronic disease that requires appropriate care and education. This would reduce morbidity by decreasing hospitalisations and absenteeism at work and at school. Patients can be

given their own peak flow meters to monitor their readings in acute exacerbations. Practitioners should have a peak flow meter readily accessible to monitor their asthmatic patients, thus objectively measuring the severity of asthma.[4]

7. CONCLUSION

Practitioners knowledge of the peak flow meter is not optimal and the use of the peak flow meter to diagnose and treat asthma is under-utilised by practitioners in Lenasia, Lenasia South and Soweto Community Health Centres.

Undergraduate university training was an important determinant of the usage of the peak flow meters.

The private sector practitioners, because of their possible greater access to continuing medical education, knew more about peak flow meters and used them more frequently as is reflected in the summary score.

Younger practitioners (20 -39 years) and those who qualified after 1980 also had higher summary scores.

8. RECOMMENDATIONS

The under-utilisation of peak flow meters emphasises the importance of introducing training on the use of peak flow meters in the management of asthma. This can be done at the university (undergraduate and post graduate level) as well as at 'grassroots' level (community).

The findings of this study could also be used to guide the national asthma campaign co-ordinators in South Africa with their strategy to improve asthma care among family practitioners.

Since asthma may be under-diagnosed in the community, further research is needed to assess the effects of mass media strategies on educating people to recognise asthma. Early recognition and diagnosis of asthma together with appropriate asthma education may significantly reduce asthma morbidity.

The role of illiteracy and cost in limiting the use of peak flow meters warrants investigation as does the possibility of developing suitable meters for populations with limited formal education.

Doctors need to make more conscientious, concerted and informed efforts to monitor their asthma patients and collaborate, where appropriate, with health educators to optimise the management of asthma. This would include workshops within the community and with fellow health care workers (doctors, primary health care sisters) on various aspects of asthma care, which will incorporate inhaler technique and peak flow meter use.

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APPENDA

APPENDIX 1:

FAMILY PRACTITIONER INFORMATION SHEET

Asthma Survey

(P.O. Box 666, Lenasia, 1820 Ph. 334-2856)

334-3876)

Code No.

Dear Doctor,

I am a family practitioner practising in Johannesburg. I have a particular interest in asthma and am presently carrying out a survey on the diagnosis and management of asthma in general practice.

The work I am doing is under the auspices of the department of Family Medicine at WITS. I am a final year, part time student completing my master degree in family medicine. As a requirement for the degree I have chosen the above mentioned survey. My research has been approved by the committee for research on human subjects. This letter is to ask for your assistance in this project.

I will be conducting a personal interview which should not take more than 30 minutes of your time. Most of your answers require either a yes or no answer. All your answers will be treated in the strictest confidence.

I intend to arrange a workshop on asthma in your practice area and will report the results of the survey at this workshop.

If you have any further questions or comments kindly contact me at the above address or telephone numbers.

Thank you for your kind assistance.

Bhadrish. K. Vallabh.

APPENDIX 2

QUESTIONNAIRE

ASTHMA SURVEY

1. Questionnaire Number: 1. QNO ☐☐☐

2. Date of Interview: 199 /___/___

DEMOGRAPHY AND EDUCATION

Researcher: "I am going to ask you a few questions about your training and practice profile".

3. Surname: _____ 2. SURNAME _____

4. First Names: _____ 3. INITIALS ____ ☐☐

5. Age: _____ 4. AGE ☐

6. Sex: Male = M Female = F 5. SEX ☐

7. University where degree obtained 6. UNIVERSITY ☐

   Wits = 1

   U.C.T. = 2

   Natal = 3

   Stellenbosch = 4

   Medunsa = 5

   University of Pretoria = 6

   O.F.S. = 7

   Non S.A. University = 8

8. Date Qualified: 19 _____ 7. DATE QUAL ☐

9. Post graduate qualifications — 8. POSTGRAD ☐

Diploma/s: (Specify) _____ — 9. RELEVAN ☐

Membership: (Specify) _____

Masters: Yes/No

PhD: Yes/No

Other: (Specify) _____

CLINICAL EXPERIENCE

10. Number of years in general practice/clinics? — 10. YRSING.P ☐

11. Do you work in an asthma clinic — 11. WORKASCL ☐

Yes = Y No = N

12. Do you have a special interest in asthma? — 12. SPECINTR ☐☐☐

Yes = Y No = N

13. How many patients do you usually see each week? — 13. PTWEEKLY ☐☐☐

14. How many asthmatics do you usually see each week? — 14. ASWEEKLY ☐☐☐

15. How many asthmatics do you have on your books?

_____ / don't know — 15. ASBOOKS ☐☐

16. Do you get the time to attend continuing medical education talks or otl er similar sessions?

Yes = Y No = N — 16. CMEATTEN ☐☐

17. How many have you attended on asthma over the past three years? _____ — 17 CMEASTHA ☐☐

ASTHMA DIAGNOSIS

Researcher: "I want to ask you some questions on asthma.
The questions are not about knowledge but rather
to establish current modes of practice in the area
so please let me know what you actually do
rather than what may be ideal in a perfect world".

18. What method do you use to diagnose asthma?

* History	Yes/No	18.	DXASHX	☐
* PEFR's Measurement	Yes/No	19.	DXAPF	☐
* Response to B2 agonist	Yes/No	20.	DXASB2	☐
* Other lung function tests	Yes/No	21.	DXALFT	☐
* Other	Yes/No	22.	DXASOTH1	☐
		23.	DXAOTH2	☐

19. How do you assess the severity of bronchospasm in your patients?

* Symptoms	Yes/No	24.	SEVSYMP	☐
* Signs	Yes/No	25.	SEVSIGN	☐
* PEFR	Yes/No	26.	SEVPEFR	☐
* FEVI	Yes/No	27.	SEVFEVI	☐
* Other (specify)		28.	SEVOTH1	☐
		29.	SEVOTH2	☐

PEAK FLOW METERS

20. Do you have an instrument/machine to measure lung function in your practice. Yes = Y No = N 30. INSTRLFT ☐

21. Do you have a peak flow meter in your rooms?

Yes = Y No = N 31. PFROOMS ☐

22. If yes: what makes is it? _____ 32. MAKEPDM ☐

* Wrights = 1
* Vistallograph = 2
* Miniwrights = 3
* Assess = 4
* Other = 5
* Don't know = 6

May I see it please Seen = 1

Not Seen = 2 33. PFMSEEN ☐

23. In your opinion how useful is routine measurement of peak flow readings in your practice? _____ 34. ROUTMEAS ☐

* extremely useful
* very useful
* useful
* not useful
* useless

24. What have you used the peak flow meter for?

(The response will have to be volunteered by the subject and an appropriate tick will be placed in the block by the researcher.)

* keep lung function close to normal 35. PFFORNNOR ☐
* assess response to treatment 36. PFFORRES. ☐
* change treatment 37. PF FORTX ☐
* diagnose asthma 38. PF FORDX ☐
* diagnose exercise induce asthma 39. PFRDXEX ☐

* diagnose occupational asthma — 40. PFFOROCC ☐
* identify trigger factors — 41. PFFORSEV ☐
* measure severity of asthma — 42. PFFORTRI ☐
* encourage self management by patients — 43. PFFORHOS ☐
* as an index of airway responsiveness — 44. PFFORSMX ☐
* other 1 — 45. PFAIRRES ☐
* other 2 — 46. PFFOROT1 ☐
47. PFFOROT2 ☐

Researcher: "In your opinion would using the peak flow meter for the following situations be useful in your practice?

25. To assess the severity of asthma

Yes = Y No = N 48. USESEVR ☐

26. To assess response of patients to treatment during acute exacerbations of asthma?

Yes = Y No = N 49. ACUTEEXA ☐

27. To exclude restrictive lung disease?

Yes = Y No = N 50. EX RESTR ☐

28. Monitoring the peak flow provides objective justification for changing therapy?

Yes = Y No = N 51. CHANGERX ☐

29. To assist you in the diagnosis of exercise induced asthma?

Yes = Y No = N 52. DX EI A ☐

30. Do you feel that the peak flow meter would assist in measuring compliance with medication?

Yes = Y No = N 53. MEAS COMP ☐

31. Do you consider it a useful instrument in devising a self management plan for asthmatics?

Yes = Y No = N 54. SELFMX PL ☐

32. Do you consider using PEFR measurements as an admission criterion for hospitalization?

Yes = Y No = N 55. HOSPILZN ☐

33. Do you usually organize or prescribe a peak flow meter for your patients with asthma?

Yes = Y No = N 56. PRESCRIB ☐

34. What proportions of your asthma patients monitor their asthma at home with a peak flow meter? 57. HOMEMONI ☐

35. What reasons limit your use of P.F. meters?

* Cost to patient	Yes = Y	No = N	58. LIMITCOS	☐
* Time it takes to teach patients	Yes = Y	No = N	59. LIMITIME	☐
* Busy practice	Yes = Y	No = N	60. LIMBUSY	☐
* Numeracy of patients	Yes = Y	No = N	61. LIMNLLIMB	☐
* Other 1 (specify)	Yes = Y	No = N	62. LIMDEP	☐
* Other 2 (specify)	Yes = Y	No = N	63. LIMILLN	☐

36. In general how useful do you find PEFR measurements to be in your practice?

* Extremely useful	= 1		
* Very useful	= 2		
* Useful	= 3		
* Not useful	= 4		
* Useless	= 5	65. PEFRMEAS	☐

37. How do you instruct a patient to use a peak flow meter? 66. INSTRUCT ☐

38. How would you assess the patients effort using a peak flow meter? 67. EFFORTAS ☐

39. How do you assess that the instrument is functioning correctly? 68. FUNCTOK ☐

40. Do you have the time to educate your patient about asthma? 69. EDUCTIME ☐

Always	= 1
75% of the time	= 2
50% of the time	= 3
25% of the time	= 4
Never	= 5

41. Do you think that educating asthmatics about their disease would reduce morbidity? 70. EDUMORBI ☐

Yes = Y No = N Unsure = U

42. Do you think that increase knowledge about their disease would lead to better drug compliance?

Yes = Y No = N Unsure = U 71. COMPLBET. ☐

43. Do you consider the general practitioner the best person to carry out patient education?

Yes = Y No = N Unsure = U 72. GIPBESTED ☐

44. Who teaches your patients how to use inhalers/discs/rotacaps/ etc.? 73. THENWHO ☐

Self = 1 Nurse = 2 Other = 3 74. TEACHES ☐

45. Would you refer your asthma patients to an asthma community support group for additional asthma education? 75. REFERASG ☐

Yes = 1 No = 2

if no, why not? _____ 76. REWHYNOT ☐

46. Would you attend a workshop on the use of peak flow meters?

Yes = Y No = N

47. What time/day would suite you best?

77. WORKSHOP ☐

78. TIMEBEST ☐

79. DAYBEST ☐

APPENDIX 3

APPROVAL FROM ETHICS COMMITTEE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

COMMITTEE FOR RESEARCH ON HUMAN SUBJECTS (MEDICAL)

Ref: R14/49 (Registry)

CLEARANCE CERTIFICATE PROTOCOL NUMBER M930914

PROJECT Family practitioners perception of, knowledge about and use of peak flow meters in Lenasia, Lenasia South, and Soweto Community Health Centres.

INVESTIGATORS Dr B K Vallabh

DEPARTMENT Family Medicine

DATE CONSIDERED 930924

DECISION OF THE COMMITTEE

Approved subject to the attached condition

DATE 930929 **CHAIRMAN** .....

(Professor P E Cleaton-Jones)

* Guidelines for written "informed consent" attached where applicable.

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and ONE COPY returned to the Secretary at Room 10001, 10th Floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorised to carry out the above mentioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

DATE 1/4/98 ..... SIGNATURE

.....

Author Vallabh B K
Name of thesis Family Practitioners Perception Of Knowledge About And Use Of Peak Flow Meters In Lenasia, Lenasia South And Soweto Community Health Centres Vallabh B K 1998

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