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Knowledge, practice pattern and attitude toward asthma management amongst physicians from Nepal, Malaysia, Lebanon, Myanmar and Morocco

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ABSTRACT

Objective: This survey aimed to understand the physicians' practice pattern and challenges faced while treating their patients with asthma in five countries-Malaysia, Nepal, Myanmar, Morocco and Lebanon.

Methods: Questionnaire-based data was gathered from internal medicine doctors (209), general practitioners (206), chest physicians (152) and pediatricians (58) from 232 locations from across the five countries.

Results: Of the 816 physicians, 374 physicians encountered at least 5 asthma patients daily. Approximately, 38% physicians always used spirometry for diagnosis and only 12% physicians always recommended Peak flow meter (PFM) for home-monitoring. Salmeterol/fluticasone (71%) followed by formoterol/budesonide (38%) were the most preferred ICS/long-acting beta$_2$-agonists (LABA); Salbutamol (78%) was the most preferred reliever medication. 60% physicians said >40% of their patients were apprehensive to use inhalers. 72% physicians preferred a pressurized metered-dose inhaler (pMDI) to a dry powder inhaler (DPI) with only a third of them using a spacer with the pMDI. 71% physicians believed that using similar device for controller and reliever can be beneficial to patients. Skipping medicines in absence of symptoms (64%), incorrect inhaler technique (48%) and high cost of medication (49%) were considered as major reasons for non-adherence by most physicians. Incorrect inhaler technique (66%) and nonadherence (59%) were considered the most common causes of poor asthma control.

Conclusions: There are opportunities to improve the use of diagnostic and monitoring tools for asthma. Non-adherence, incorrect inhaler technique and cost remain a challenge to achieve good asthma control. Asthma education, including correct demonstration of inhaler, can potentially help to improve inhaler adherence.

Introduction

Asthma is a chronic inflammatory disease of the lung airways affecting children and adults (1). According to the recent Global Asthma report 2018 by Global Asthma Network (GAN), asthma affects 339 million people worldwide. It causes a significant impact on the quality of life of the patients and leads to premature death. Asthma ranks 28th in the world for leading causes of burden of disease and ranks 16th in the leading causes of years lived with disability (DALYs-Disability Adjusted Life Years). Overall prevalence of asthma in Asian adult population is approximately 5%, which might appear less than the European

countries, however, it possess a huge disease burden with very high mortality rate (2). For example, Sri Lanka stands second, Myanmar is fourth position in the rankings for asthma related deaths across the globe. Further, a fast urbanization and increase in outdoor air pollution levels in the region might lead to increase in the prevalence of asthma in future (3). Similarly, the asthma insight and reality study in the Maghreb (AIRMAG) suggested the prevalence of asthma in the region was moderate, however, its impact was high (4). Further, as per ISSAC phase I and III, Morocco had the burden of asthma between 10% and 15% in a sample of children aged 13–14 years (5). In a study of

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⊕ Supplemental data for this article can be accessed at publisher's website.
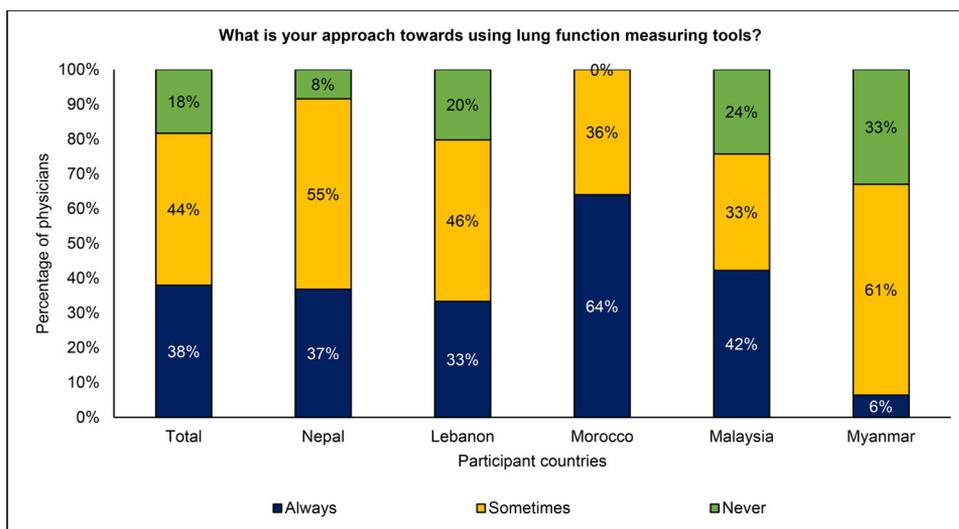
Figure 1a. Spirometry for diagnosis.

asthma in Lebanon, the prevalence of asthma (defined as hyper-reactive airways) was estimated to be 9% (6). An another study which measured the asthma control in Lebanon, demonstrated that nearly 20% of hospitalized patients had poorly controlled asthma (7).

The global initiative for asthma (GINA) recommends treatment of asthma with various inhaled corticosteroids (ICSs) and their combination with long-acting β_2-agonists (LABAs) as a controller therapy for the underlying inflammation and to reduce the future risk of exacerbations. Spirometer and peak flow meter are recommended for the diagnosis as well monitoring of symptoms of asthma (8). However, as we observe the trends of clinical practice, regular use of these instruments is limited, and it largely depends on the physicians' understanding about the disease.

Physician surveys are important because they keep a track on the use of diagnosing methods, management therapies, pharmacological effects, ease of using the technologies and the factors that affect the asthma burden on the nation. Knowledge of physician perspectives is an essential element on which interventions are based to improve the quality of care to the population (9,10).

The gap in knowledge about asthma and its management is well recognized. Many international guidelines have been published with the aim to standardize the diagnosis and management of asthma (11). However, there is not much data on how clinicians perceive the diagnosis and management of asthma in low- and middle-income countries of Asia and north Africa as per the international guidelines. Therefore, this survey was conducted with an aim to understand the physicians' practice pattern and challenges faced while treating their

patients in 5 countries (Nepal, Malaysia, Lebanon, Myanmar and Morocco) from these regions.

Materials and methods

Study design and participants

This was an observation-based survey of general practitioners (GP), physicians, pediatricians and chest physicians. This survey was carried out in five countries – Malaysia, Nepal, Myanmar and Morocco and Lebanon. Physicians from different countries were identified from various practice settings such as private clinics, private hospitals, government hospitals and academic institutions from a total of 232 locations spread across all five countries. Total number of physicians participated was 816. We have done the purposive sampling for the selection of the doctors who have respiratory practice and treat good number of patients with asthma.

The survey protocol ensured safety and confidentiality of data, consent of the participating physicians, complete transparency of the survey design and the initiator, and a voluntary right to withdraw from the study. Data sharing consent was obtained from the healthcare professional prior to filling the questionnaire. A separate data sharing consent was also obtained from the principal investigators of the respective countries (Appendix 2, Supplementary material; Figure 1).

Survey administration

Most of the surveys were conducted in English, whereas, French language was used for the survey in Morocco. Surveys were administered with paper questionnaires.
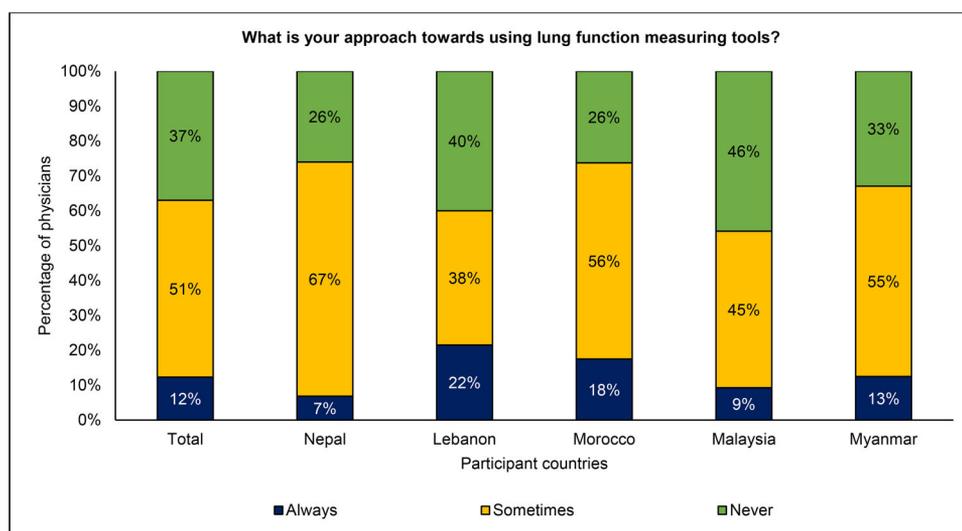
Figure 1b. Peak flow meter for at-home monitoring.

Questionnaire

The questionnaire (Appendix 1, Supplementary material) contained 17 questions sectioned under topics of demographics, diagnosis, management, inhalation therapy, devices and adherence. The questionnaire was prepared, verified and reviewed by key external and local experts. The questionnaire was in the form of multiple-choice answers, wherein some questions gave the flexibility to choose more than one answer, or register a response using a 3-point Likert scale (ranging from "agree" to "disagree").

The duration of the survey was 1 month and was conducted in November 2017. Around 200 physicians were enrolled from each country with the response rate of 51% in Lebanon, 52% in Morocco, 65% in Nepal, 106% in Myanmar and 136% in Malaysia.

The filled-in questionnaires were collected from the physicians and sent for statistical analysis at Chest Research Foundation (CRF), Pune, Maharashtra, India. The primary data analysis of these surveys mainly included calculation of descriptive statistics and frequency distributions. The analysis was performed using SPSS version 22.0. The surveys were not sponsored monetarily or otherwise.

Results

Demographics

The cumulative analysis was based on data from a total 816 physicians from 5 countries i.e.Malaysia, Nepal, Myanmar and Morocco and Lebanon.

66.4% physicians were general practitioners and internal medicine doctors, 9.3% were pediatricians and 24.3% were chest physicians (Appendix 2, Supplementary material; Figure 2). 59% physicians were practicing in hospital setting whereas 48% physicians worked in their clinics. 4.4% physicians were reported to be practicing in other facilities including medical centers.

Approximately 46% physicians said they see at least 5 asthma patients every day. In Morocco, 86% physicians said they encountered more than 5 patients daily (Appendix 2, Supplementary material; Figure 3) and 91% of the patients were above 15 years of age. 37% physicians from Nepal reported that the highest number of their patients belonged to the age group of below 12 years. In Myanmar, almost 70% physicians encountered highest number of patients who were above 25 years of age (Appendix 2, Supplementary material; Figure 4).

Diagnosis and monitoring

On an average from all the five countries, only 38% physicians surveyed always used a spirometer to diagnose asthma; the highest percentage coming from Morocco with 64% physicians diagnosing asthma with spirometer. 33% physicians in Myanmar said that they never used a spirometer for diagnosing asthma (Figure 1a). Use of a peak flow meter to monitor asthma at home was never used by 37% of physicians (Figure 1b).

Based on the data from 5 countries, a total of 79% physicians call their patients with controlled asthma for follow up either every month or every 3 months to adjust their treatment (Appendix 2, Supplementary material; Figure 5a). Likewise, for patients with uncontrolled asthma, Myanmar reported with more
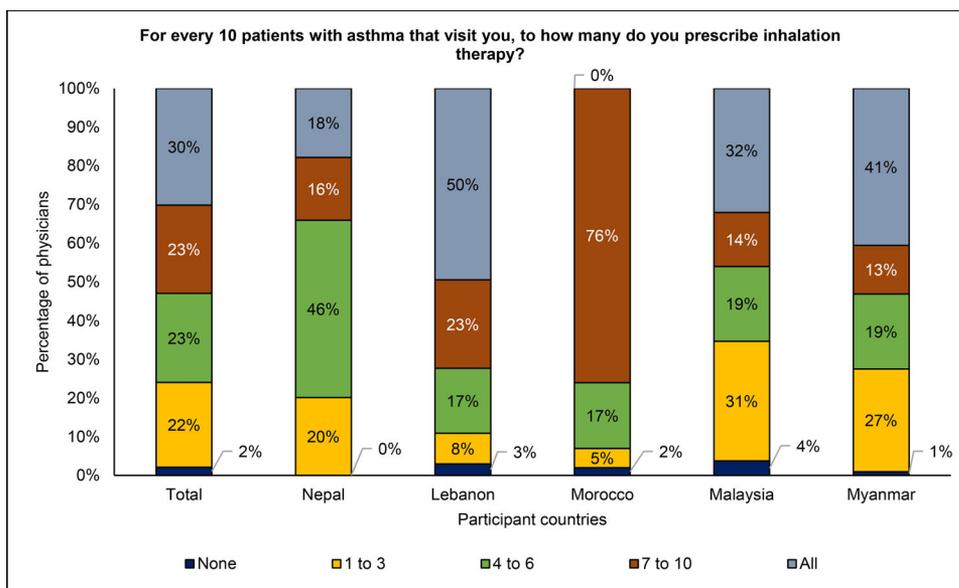
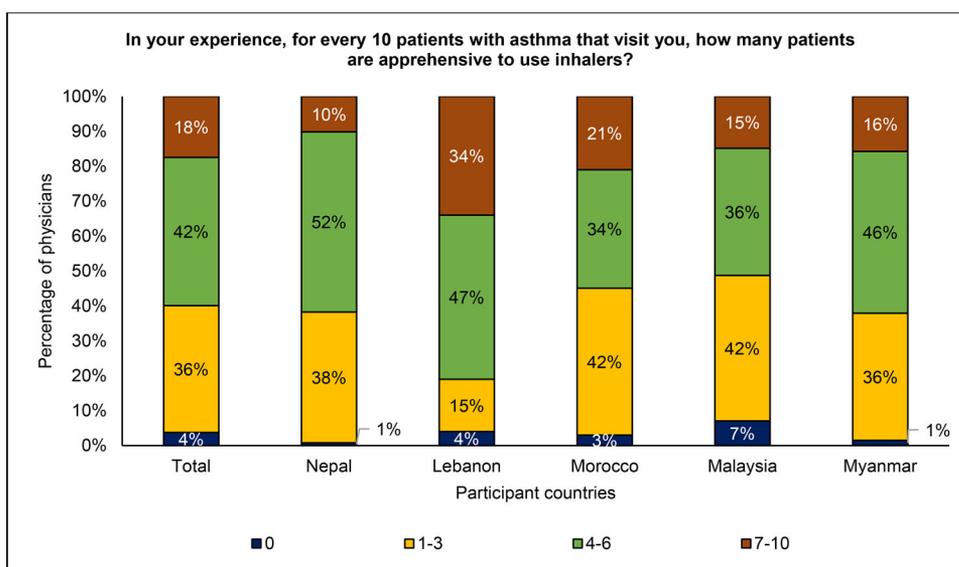**Figure 2.** Number of patients with prescribed inhalation therapy.

Figure 3. Number of patients apprehensive to use inhalers, out of 10.

than 99% physicians following up with their patients every month as stated in the guidelines. Overall, 13% physicians still call their patients after 3 months for uncontrolled asthma follow up (Appendix 2, Supplementary material; Figure 5b).

Management

Fluticasone (58%) followed by budesonide (47%) were the most preferred inhaled corticosteroids followed by beclomethasone (19%). 10% physicians said that they used only short-acting beta$_2$-agonists (SABA) for the treatment of asthma (Appendix 2, Supplementary material; Figure 6). For a combination of ICS/LABA, 71% physicians preferred salmeterol/fluticasone combination (SFC), 38% physicians preferred formoterol/budesonide combination (FBC) and almost 10% physicians preferred salbutamol/beclomethasone combination (Appendix 2, Supplementary material; Figure 7).

On an average, salbutamol was the most popular (78%) reliever medication amongst the physicians. Almost 16% physicians also preferred Single Maintenance and Reliever therapy (SMART) therapy with FBC, with Lebanon demonstrating the highest number of 32%. Around 5.1% physicians also prescribed short-acting muscarinic antagonists (SAMA)
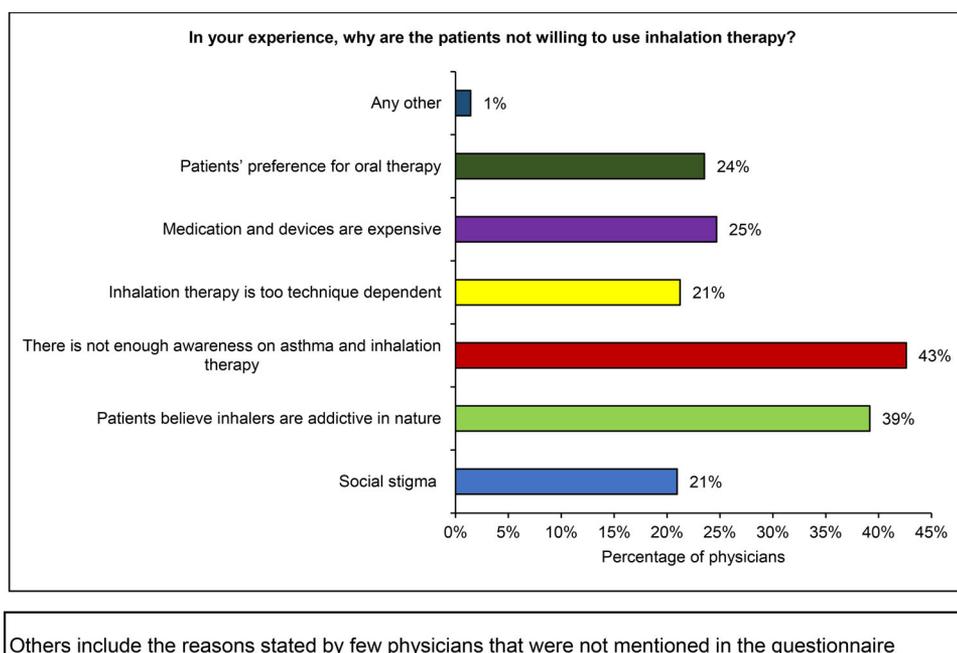
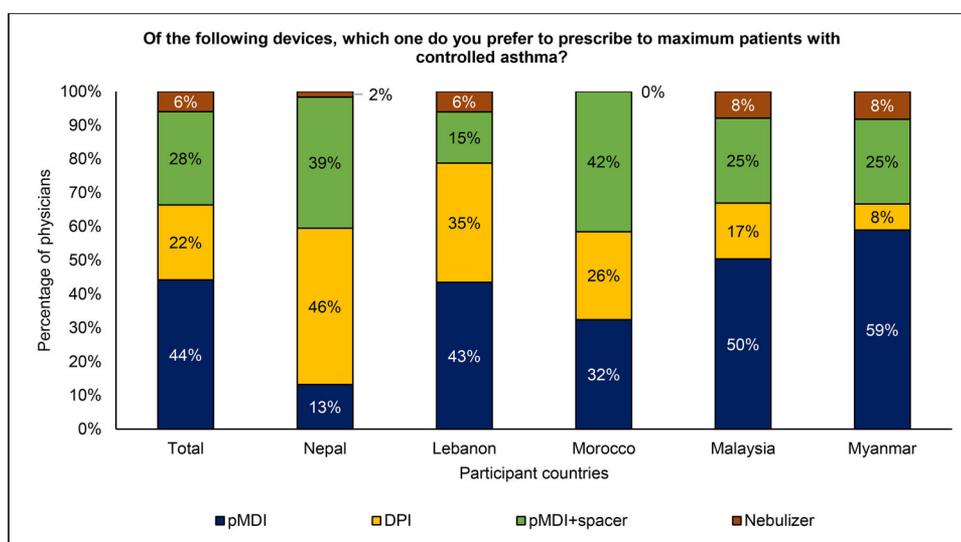**Figure 4.** Reasons for patients not willing to use inhalation therapy.

Figure 5. Most prescribed device for patients with controlled asthma.

ipratropium even though it is not indicated in asthma (Appendix 2, Supplementary material; Figure 8).

Inhalation therapy

47% of physicians reported prescribing inhalation therapy in up to 60% of their patients with the lowest from Nepal. Less than half prescribed it to all their patients (Figure 2).

Overall, 60% physicians said that more than 40% of their patients were apprehensive to use inhalers. (Figure 3).

The most common reasons for being apprehensive to use inhalers was believed to be lack of awareness about asthma and inhalation therapy, and fear of addiction to the inhalers. Other reasons cited were social stigma, cost, preference for oral drugs and technique dependency. In some countries like Myanmar (37%) and Lebanon (30%), the cost of medicines and devices were also influential for this apprehension (Figure 4).

Devices

Overall, 72% physicians preferred a pressurized metered-dose inhaler (pMDI) with or without the
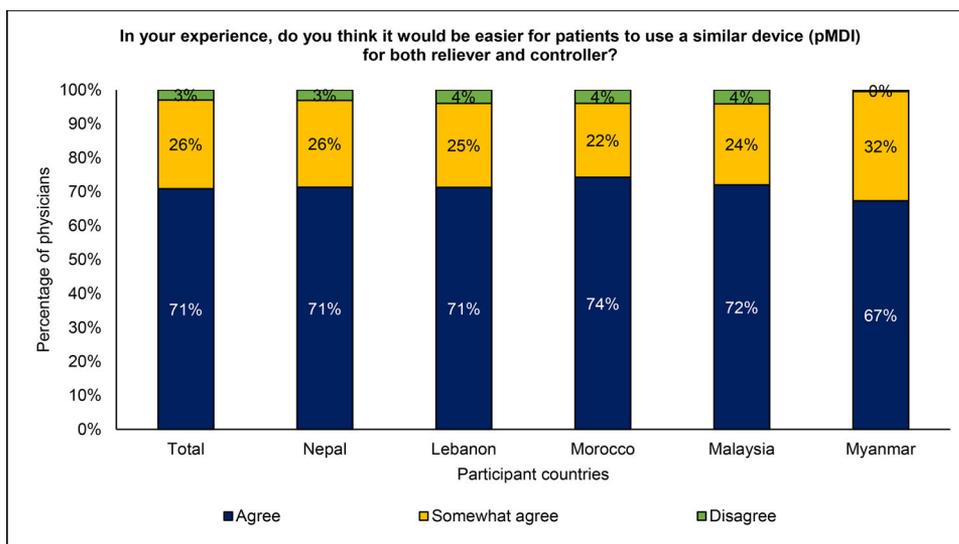
Figure 6. Patients' ease of use in using similar device for both reliever and controller.
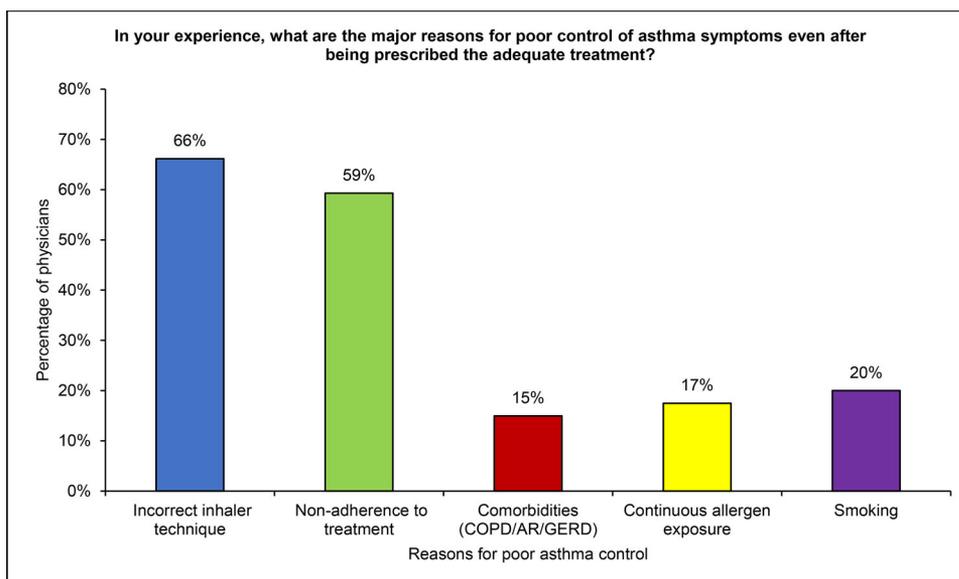

Figure 7. Reasons for poor asthma control.

spacer when compared to dry powder inhaler (DPI) or nebulization. However, there was no such preference seen between pMDI and DPI in Nepal, where pMDI and DPI were preferred equally. Nebulizer was found to be the least preferred inhalation device in all the countries (Figure 5).

Almost 63%, (range 48% in Lebanon to 83% in Nepal) said that they do not prescribe the same inhaler device for both controller and reliever (Appendix 2, Supplementary material; Figure 9). Approximately, 97% physicians do agree (either completely or to some extent) that it would be beneficial for their patient if they will use the similar inhaler device for both controller and reliever therapies (Figure 6).

Patient adherence and asthma control

Incorrect inhaler technique (66%) and non-adherence to treatment (59%) were regarded as the most important reasons for poor asthma control by most of the physicians (Figure 7). Other reasons included comorbidities, continuous exposure to allergens and smoking,

Approximately 20% physicians believed that more than 70% of their patients showed good adherence (>80%). Further, about 23% (range 6% in Lebanon to 32% in Myanmar) physicians believed that that <30% of their patients showed good adherence (Figure 8).

47% physicians (ranging from 40% in Nepal to 70% in Morocco) checked their patient's inhalation technique at every visit and 51% physicians (ranging
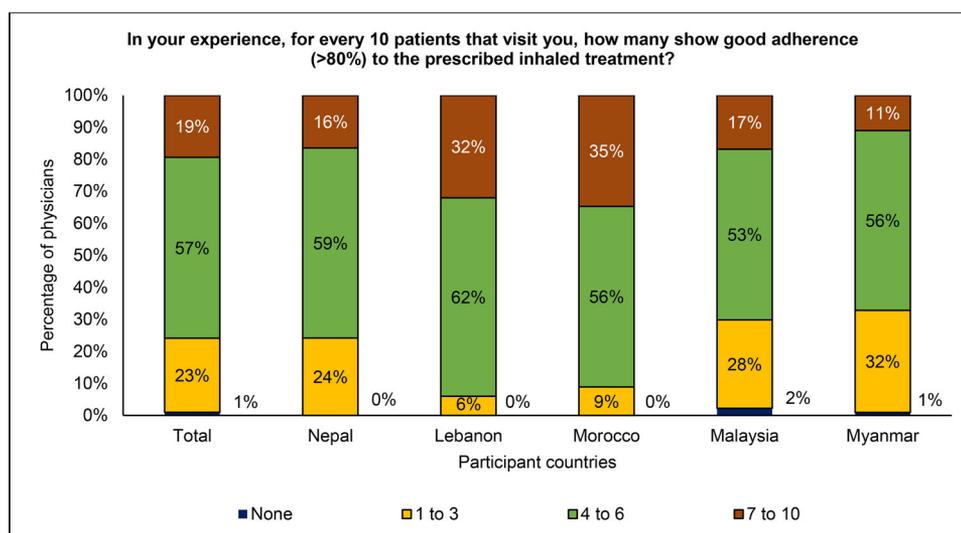
Figure 8. Number of patients out of 10 who showed good adherence to prescribed inhaled treatment.

from 30% in Morocco to 59% in Myanmar) check it when they suspect a wrong technique performed by the patients (Appendix 2, Supplementary material; Figure 10).

Skipping medicines in absence of symptoms (64% physicians), incorrect inhaler technique (48.6%) and high cost of medications (48.7%) were considered as the major reasons for non-adherence by most of the physicians (Appendix 2, Supplementary material; Figure 11).

Discussion

The present survey was conducted in the five countries of Lebanon, Malaysia, Nepal, Myanmar and Morocco with an intention to understand how physicians from different countries perceive their patients with asthma, how it is being managed, and what are the various treatment challenges they come across in their daily practice. Overall, this study demonstrated that there are significant opportunities to improve the diagnosis and monitoring, patient adherence and inhaler technique in asthma management to achieve good asthma control.

Incorrect diagnosis of asthma can cause unnecessary or inappropriate consumption of medications and increased economic burden on the patients (12). Misdiagnosis contributes to increased morbidity and mortality of patients whereas early detection and timely treatment can improve the long-term prognosis of affected individuals (13). A study done in Canada reported that making a correct diagnosis of asthma is cost effective as well as cost saving (14). GINA recommends use of spirometry for diagnosis of asthma to

avoid misdiagnosis, under diagnosis and over diagnosis of asthma (8). In the current survey, an average from all countries data report that only approximately 38% physicians always and regularly use the spirometer for diagnosis of asthma. This is in line with the literature which also suggests the suboptimal use of spirometer in Asian countries (15). On the contrary, the data from Myanmar shows only 6.3% of the physicians surveyed in Myanmar responded that they used the spirometer to diagnose all their asthma patients, which is very low. Further, approximately 1 out 4 physicians in Myanmar never used any lung function measuring tools for diagnosis and monitoring of asthma. As per data from WHO, Myanmar stands fourth in the worldwide ranking of asthma related deaths (16). Nevertheless, we should not attribute all these to lack of knowledge about diagnosis or noncompliance, the poor resources and lack of infrastructure also play a major role in this context. There is a scarcity of doctors in Myanmar (0.568 doctor per 1000 population), perhaps, other trained healthcare providers (pharmacists, nurses and allied medical staff) who could aid in the better asthma management in the country (17).

However, the data from Morocco states that all the physicians used spirometry for diagnosis and 60% physicians claimed to use it always. This result is strikingly different from the overall population of the other four countries and can be attributed to the fact that all the survey participants from Morocco were chest physicians versus the participants from other countries. These type of differences amongst different specialties in the utilization of spirometry have also been documented in the existing literature (18).

GINA recommends the monitoring of peak expiratory flow (8). It gives the patient a feedback on their progress. An improvement in the PFM score can provide encouragement for maintaining adherence to the medication. It can indicate the narrowing of the airways in advance and thereby preventing an impending exacerbation (19). It is easier for the doctor to analyze the numbers and redesign the prescription if needed. Since, hypertension cannot be diagnosed and confirmed without a sphygmomanometer likewise, asthma should not be diagnosed based on clinical judgement alone. The underusage of these devices eventually leads to complicating consequences. Previous studies have shown that self-management program that includes home-monitoring and education leads to improved outcomes of asthma (20–23). A similar study report on children with asthma demonstrates that patients using PFM had better asthma control after 3 months of follow-up (24). The results of the present survey demonstrate that Malaysia shows the lowest score on physicians recommending PFM for home-monitoring, whereas Lebanon shows the highest score for recommending it always.

GINA recommends ICS or a combination of ICS and LABA to be administered for maintenance therapy of asthma whereas SABA to be used as a rescue medication (8). In the current study, when given a choice between prescribing an ICS or a SABA only, an average of 10% of physicians preferred to use a SABA only. Amongst the various options for combination therapy given as choices the most popular ICS among the physicians was fluticasone, followed by budesonide. 71% of physicians responded in favor of salmeterol/fluticasone as the highest prescribed drug combination. Formoterol/budesonide was the second most preferred choice for the maintenance of asthma.

Our study has shown that salbutamol is a widely prescribed reliever medication in all the countries. While, Ipratropium is not in the list of recommended medications for asthma as a reliever it was still used by an average of 5.1% physicians in all countries and 10% of which is contributed by Lebanon. Formoterol/budesonide combination is also recommended to be used as a SMART therapy. In trials such as the COMPASS (25), STAY (26) and COSMOS (27) trials, it is reported that SMART therapy with formoterol/budesonide combination significantly reduces severe exacerbations in adults and adolescents and increases time to next exacerbation. Having said this the results from the present study show, not more than 16% physicians prefer it. However, in Lebanon, it was observed that almost 32% physicians prescribed the SMART therapy as a reliever and maintenance medicine both; whereas in Morocco, this response was very unpopular with only 2% physicians.

Inhalation therapy is the cornerstone of asthma management because an inhaler delivers the drug directly at the site of action i.e.the lungs as opposed to the oral route. Inhaled route of administration ensures reduced systemic side effects and lower quantity of drug requirement (28). Through our survey we wanted to understand the percentage of physicians who advocate inhalation therapy and the percentage of patients who accept it willingly. On an average, a total of 30% physicians from all Nepal, Lebanon, Malaysia and Myanmar prescribed inhalers to all the patients with asthma they treat while in Morocco no physician prescribed inhalers to all their asthma patients. In a survey done with parents of asthma patients in Lebanon, it was reported that 67% parents preferred oral therapy over inhalation while 48% parents believed inhalers were addictive, 56% were anxious about the side effects of using inhalers and 76% were worried about using ICS. In another study done in Malaysia, children between 2 to 5 years of age were less likely to be prescribed with inhalation therapy as compared with children more than 5 years of age. Parents' negative notion about inhalation therapy for their children also contributed largely to this malpractice of not prescribing inhalation medication (29). In line with this, in the current survey, it was observed that the most common reasons believed by the physicians for patients' apprehension were lack of enough awareness about asthma and inhalation therapy and the belief that inhalers are addictive in nature. Almost 24% physicians believed that their patients preferred oral therapy over inhalation.

Devices used in respiratory diseases are equally important as the drugs used for the treatment (28). A variety of devices like pMDI, Dry powder inhaler (DPI), Breath Actuated Inhaler (BAI), nebulizers, spacers have established their position in asthma care. Each device has its uniqueness and is specifically suitable to different patients. However, pMDIs are the most popular and largely prescribed devices worldwide (30). The present survey also revealed that almost 72% physicians preferred the pMDI with or without a spacer with an exception of Nepalese physicians who preferred DPI and pMDIs equally. A retrospective observational study reported that the patients using the same device for reliever and controller medication were more likely to achieve asthma control and reported significantly lower severe exacerbation rates (31). The present study demonstrated that a

large population of physicians preferred to prescribe the same type of device for reliever and controller medication. And almost all (97%) of the physicians agreed that using the same device would be more beneficial and easier for the patients.

Adherence and compliance to the asthma medication is one of the main contributing factors to ensure adequate asthma control and prevention of symptoms/exacerbations (32,33). The Global Asthma Physician Survey (GAPS) done in 6 countries in 2017 stated that the major barriers for patients' not being adherent was that the patients were taking medication only when required, were accepting the symptoms and not estimating the benefits of the treatment (34). In line with this, in the present survey, the patients were skipping the medication in absence of symptoms. Additionally, the high cost of medication and incorrect inhaler technique were also the reasons for noncompliance. Cost of the therapy becomes even more important, in the countries included in this study where, most of the patients pay for medication out of pocket and not covered by insurances. In this situation, not visiting the doctors and lack of money for medication can lead to noncompliance to the treatment. Moreover, lack of adequate number of doctors can also contribute to the overall poor control of the asthma symptoms in the population. Further the concept of critical errors in device use needs to be standardized for evaluation of technique. Also, only 19% physicians said that more than 70% of their patients showed good adherence to the prescribed therapy. High cost of medication was one of the major concerns in Myanmar, whereas incorrect inhaler technique was a high common reason in all other countries that emphasizes the importance of learning and teaching the correct inhalation technique. It is strongly recommended by the guidelines to inspect the inhaler technique of every patient at every follow-up visit, as reviewing and assessing are the major components of the asthma management cycle (8). When all the reasons were compared for poor asthma control, once again wrong inhaler technique was observed to be one of the highest responded answer by maximum physicians from all the countries. Educating and training of these patients consistently and persistently plays a major role for the respiratory health care professional.

In the literature most of the data is usually from the Europe, United states of America, United Kingdom, and Japan. There is a significant paucity of data, from the emerging markets specifically Middle East North Africa, and Asian subcontinent. This study was an attempt to explore the practice patterns of the doctors from 5 different countries. However, there were few limitations of the study, for example, different specialties were surveyed, however, this was unavoidable because of the real-life distribution of the doctors in different countries. In Morocco, only pulmonologists participated in the study whereas Nepal doesn't have many chest physicians, hence we had to include the physicians and/or GPs that possess good respiratory practice to get clear picture of clinical practice in country. Also, the 5 countries which are included in the survey were not exactly similar to each other. Furthermore, the study addresses a very important aspect of noncompliance with the inhaler treatments, we could have added few questions to differentiate between pediatric and adult population which could also be considered as one of the limitations.

Conclusions

In all the five countries, there are opportunities to improve the use of tools such as spirometer and PFM for the diagnosis and monitoring of asthma. Fluticasone is the most preferred ICS; fluticasone/salmeterol is the most preferred ICS/LABA combination. Most of the physicians believe that nonadherence due to compliance, incorrect inhaler technique and cost are the most common causes of suboptimal asthma management in the patients. Asthma education, including correct demonstration of inhaler, can potentially help to improve inhaler adherence.

Acknowledgements

Declaration of interest

Dr Urvi Khorani, Dr Vaibhav Gaur and Dr Jaideep Gogtay are permanent employees of Cipla Ltd. Other authors have no conflict of interest for this study. No honorarium was given to any of the authors for conducting this study. The authors alone are responsible for the content and writing of the paper.

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