

Is pharmacy personnel a significant source of information for patients with asthma?

→ **Sirpa Peura**

MSc, Association of Finnish Pharmacies, Helsinki, Finland

→ **Juha Jantunen**

MSc, Allergy, Skin and Asthma Federation, Finland

→ **Johanna Salimäki**

MSc, Association of Finnish Pharmacies, Helsinki, Finland

→ **Lellu Leinonen**

MSc, Association of Finnish Pharmacies, Helsinki, Finland

→ **Tari Haahtela**

Prof. emeritus,
Skin and Allergy Hospital,
Helsinki University Hospital,
University of Helsinki, Finland

→ **Paula Kauppi***

MD, PhD , Associate Professor,
Skin and Allergy Hospital,
Helsinki University Hospital,
University of Helsinki, Finland,
paula.kauppi@hus.fi

*Correspondence

SUMMARY

Objective: The aim of this study was to explore how patients obtain the information and education on the use of asthma medications.

Material and methods: The study was conducted as a survey in 2010 (n=1207) and 2016 (n=956) during one week on September with individuals purchasing asthma and allergy drugs in Finnish pharmacies all around the country. The study participants were asked from where (physician, nurses, pharmacists, patient associations, courses or books and journals) they received information concerning asthma drugs and how much information they had received. The respondents were divided into most severely ill (MSI, emergency care or hospital care for asthma) and less severely ill asthma patients (LSI, the other asthma patients without emergency care).

Results: Physicians were the most frequent source of information for the MSI asthma patients (60% of patients), followed by pharmacists (55%) and nurses (45%). Pharmacists informed more equally the most severely ill asthma patients (MSI) and LSI asthma patients. All in all, 7% of the MSI patients and 21% of the LSI patients reported not having received any information either from physicians, nurses or pharmacists.

Conclusions: Pharmacy personnel distribute regularly information on asthma medication and this should be further strengthened. Although most of the asthma patients recalled having received information on their asthma drugs still every fifth patient reported not having received any information. It is important to continuously pay attention to proper education for guided self-management and to further improve sources for asthma information in order to achieve good asthma control.

Key words: asthma, drug, pharmacy, pharmacy personnel, information and education on medication

INTRODUCTION

Adherence of asthma patients to their medication is crucial for symptom control and to prevent exacerbations. Nevertheless, a significant proportion of patients have insufficient adherence to the medications or use the medication improperly or have both (Sinclair *et al.* 1987, Diamond and Chapman 2001, Schulz *et al.* 2001, Barber *et al.* 2004, Gregoriano *et al.* 2018).

It has been repeatedly demonstrated that sufficient patient information and education on disease improves treatment adherence and asthma control, leading to substantially better outcomes (Cordina *et al.* 2001, Barbanel *et al.* 2003, Bunting and Cranor 2003, Gregoriano *et al.* 2018, Stanford *et al.* 2019). However, there are only few reports on the access, amount, sources, and the matching of the information and education on disease with the needs of specific patient populations (Närhi *et al.* 2001).

To support the well-being of patients with asthma, to decrease disease severity and mortality and to control the economic burden, a comprehensive Finnish National Asthma Programme (FNAP) was implemented in Finland 1994–2004 (Haahtela *et al.* 2006). As the patients' empowerment for the success of the treatment is essential, the FNAP emphasized self-management guided by physicians, nurses and pharmaceutical personnel. Therefore, the FNAP recommended establishing of a specialized asthma nurse and pharmacist network in the Primary Health Care and pharmacies. However, little is known what is the current distribution of the patients' self-management guidance between the networks and professions, and specifically, how the pertinent information and education on disease has been delivered to the patients.

The current study explores how patients obtain information and education on asthma and on the use of asthma medications – what are the sources and amount of the information and education. The primary hypothesis of the study was that physicians are the most common source of the information and education on asthma, followed equally by nurses and pharmaceutical personnel, with only negligible impact from other sources. Secondary hypothesis was that the most severely ill (MSI) patients obtain more extensive information from each of the sources than their less severely ill (LSI) counterparts.

MATERIAL AND METHODS

The present asthma study was a part of a large nationwide allergy and asthma survey. Allergy Barometer questionnaires were given to all individuals purchasing asthma and allergy drugs in pharmacies all around Finland in September 2010 and 2016 (Kauppi *et al.* 2015, Jantunen *et al.* 2018). The Allergy Barometer is a questionnaire on demography (gender, education), diagnosis, specific allergy- and asthma-related symptoms and medications, precipitating factors, the participants' subjective perceptions on the severity of their disease, tobacco smoking, use of Health Care Services, received guided self-management advice and opinions on the need of information of asthma and asthma medication. In 2010 patients were also asked if they like to make an appointment with pharmacy personnel for the information and education of asthma drugs. The patients were enquired how much they had received information on allergy or on asthma from physicians, nurses, pharmacies, patient organizations, courses and books. Internet as a source for information was enquired in the survey only in 2016. In addition, they were enquired which of the following they found difficult (taking medication at time, understanding instructions for use, inhalation technique, safety of medication, or not having problems or some other problem (if so, what it would be). Pharmacies were asked to enroll the first five patients purchasing asthma and allergy medication during the week.

The inclusion criteria for the asthma branch were: age 16–75 years, diagnosis of asthma, and special reimbursement for asthma medication. Based on their current medication, patients with the Chronic Obstructive Pulmonary Disease were excluded.

The patients who were treated in the emergency room or who had at least one day hospital care within the last year were defined as the most severely ill (MSI). All the other asthma patients were categorized into the less severely ill (LSI) group. From altogether 1 207 responders in 2010, 538 patients (n=66 for the MSI and n=472 for the LSI group) were eligible for the analysis (**Figure 1**). In 2016 956 responses were received and 492 of them were included in the study (n=77 for the MSI and n=415 for the LSI group). Results in 2010 and 2016 are presented as sums of both years if the study year is not mentioned.

Statistical significances of differences between the sources of the information and education for MSI and LSI patients were assessed with Pearsons' chi square independence test. P values of <0.05 were considered statistically significant.

Table 1. Sources of information and education for asthma patients (% of responded, sum of years 2010 and 2016). MSI = severely ill asthma patients (emergency care or hospital care for asthma) and LSI = less severely ill asthma patients (the other asthma patients without emergency care).

		MSI %	LSI %	All %	Pearsons' χ^2 -test (p)
Physician		n=140	n=840	n=980	
	Not at all	13	44	39	< 0.001
	Some	27	21	22	
	Quite a lot	25	21	22	
	A lot	35	14	17	
Nurse		n=134	n=811	n=945	
	Not at all	33	62	58	< 0.001
	Some	22	18	19	
	Quite a lot	26	12	14	
	A lot	19	8	9	
Pharmacy personnel		n=133	n=828	n=961	
	Not at all	20	33	31	< 0.001
	Some	25	31	30	
	Quite a lot	30	24	25	
	A lot	25	12	14	
Patient organizations		n=122	n=780	n=902	
	Not at all	86	90	89	0.436
	Some	8	5	6	
	Quite a lot	5	3	3	
	A lot	1	2	1	
Courses		n=122	n=781	n=903	
	Not at all	93	94	94	0.878
	Some	2	2	2	
	Quite a lot	2	2	2	
	A lot	2	2	2	
Books, journals etc.		n=128	n=823	n=951	
	Not at all	38	39	39	0.227
	Some	25	31	30	
	Quite a lot	23	20	20	
	A lot	15	10	11	
Internet (only 2016)		n=71	n=381	n=452	
	Not at all	34	50	48	0.069
	Some	28	23	24	
	Quite a lot	24	17	18	
	A lot	14	9	10	

RESULTS

Of all sources of information and education on asthma medication received by the MSI patients, the most abundant source was physicians (60% with quite a lot or a lot of information altogether). This was followed by pharmacists (55%), nurses (45%), books or journals (38%), patient associations (6%) courses (4%) and the internet 38% (assessed only in 2016) (**Table 1, Figure 2 and 3**). In 2010, 78% of the respondents were women and in 2016, 79% of the respondents were women (p non-significant (ns)). Likewise, the mean age of the respondents was 52.5 years (SD 14.7) in 2010 and 54.5 (SD 14.8) in 2016 ($p = 0.031$). Distribution of education level of the respondents were similar in both years. Of the respondents in 2010, 23% had received university degree and 29% in 2016, correspondingly (p ns).

The MSI patients received information statistically significantly more often than their LSI counterparts from physicians and nurses in 2010 and 2016, and from pharmacy in 2016. No such differences were found for other sources. Of the MSI patients, 20% reported not having received any information from the pharmacy, while corresponding figure for physicians was 13% and for nurses 33% (**Table 1, Figure 2**).

Of the LSI patients, 35% reported having received quite a lot or a lot of information from physicians, 36% from pharmacists, and 20% from nurses. Of the LSI patients, 33% reported not having received any information from the pharmacy. Of the LSI patients, 44% reported not having received any information from physicians and 62% from nurses. Of all asthma patients 19% (7% of MSI, 21% LSI patients) reported not having received any information either from physicians, nurses or pharmacist (**Table 1, Figure 2**).

In the group of LSI patients, information given by nurses had increased significantly (a lot or quite a lot from 17% in 2010 to 23% in 2016) and information received from books and journals had decreased (a lot or quite a lot from 35% in 2010 to 25% in 2016). In the group of MSI patients, corresponding differences were not detected (**Table 1, Figure 2**).

58% of the MSI patients and 54% of LSI patients (in 2010), considered that a scheduled appointment with pharmacy personnel for the information and education on the medication was desirable.

DISCUSSION

In this study, physicians were the most frequent source of the information and education of asthma, as expected. What was unexpected was the higher pro-

portion of the information given by the pharmaceutical personnel than that provided by nurses. Furthermore, while the physicians and nurses seem to focus mostly on the MSI patients, the pharmacy personnel divided their effort more equally between the MSI and LSI patients. Moreover, one fifth of all the patients reported not having received any information and education whatsoever from the health care professionals. Of other sources, such as the books, journals and the internet were also important, whereas patient organizations and courses had only minor impact.

In 2001, 69% and 23% of the study participants had appointment with a physician or a nurse, respectively (Haahtela *et al.* 2006). In 2010, the corresponding figures remained unchanged, 65% and 22% (Jantunen *et al.* 2018) indicating an information and education gap in the Primary Care. However, all of these patients were in contact with pharmaceutical personnel when buying their asthma medication which offers to the latter an opportunity to reduce this gap. Nevertheless, it seems that in some cases the information and education was not provided by the pharmacy personnel either, despite the requirement of Finnish legislation for pharmacy personnel to ensure the proper and safe use of the dispensed medicines (Medicines Act 395/1987). Probably limited time for one patient or insufficient guidance to patient education may prevent proper information and education from pharmacy personnel. Reluctance to receive information or rush may be obstacles from the patient perspective.

It is not surprising that physicians and nurses, who are aware of the severity of illness of their patients, invest – in accordance with the patients' need – more information and education work in the MSI than in the LSI populations. Since the pharmaceutical personnel do not have such data on the disease, they seem to divide the information and education more equally between the MSI and LSI. Nevertheless, for the MSI patients, pharmacists represent the second most important source of information and education.

For the LSI patients, the pharmacy personnel and physicians were an equally important source of information and education. The role of information and education delivered by pharmacy personnel appears to be a valuable resource, which is worth of further development to secure access of pertinent information and education for both MSI and LSI patients. This would be in concert with the opinion of the patients surfaced in our study.

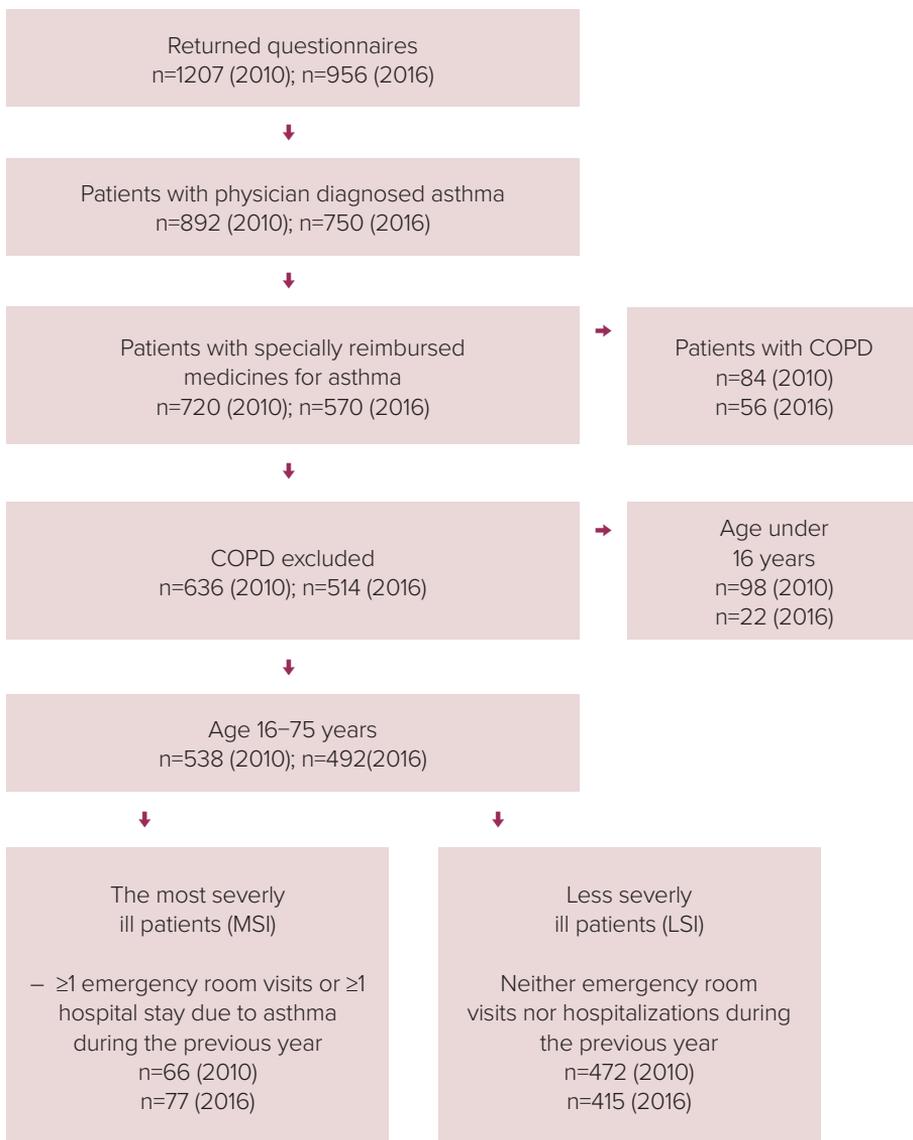


Figure 1. Patient selection to the study population.

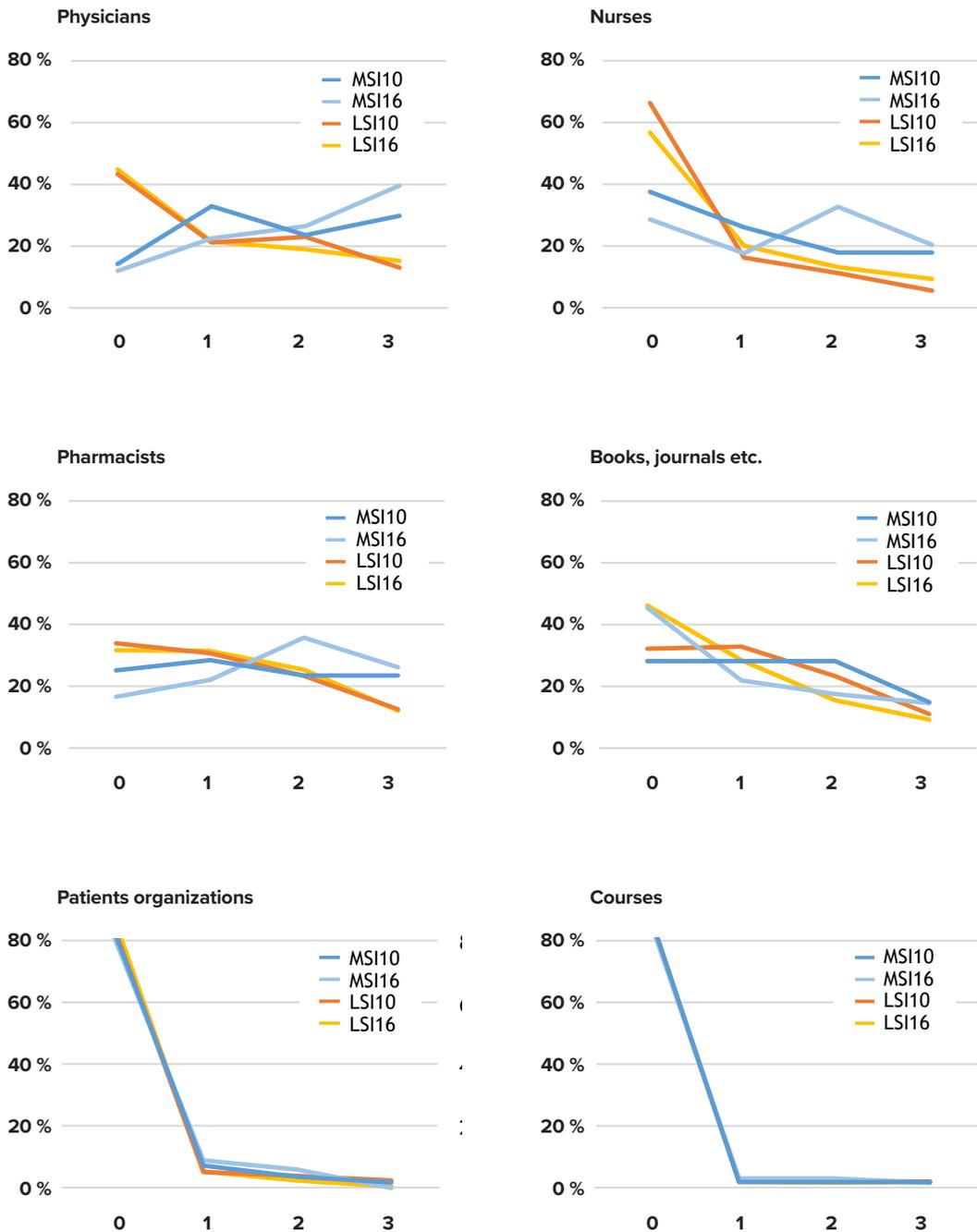


Figure 2. The information source for asthma and asthma medication reported by the most severely ill asthma patients (MSI) and less severely ill asthma patients (LSI) in 2010 and 2016. 0 = no information, 1= some information, 2= quite a lot, 3 = a lot of information.

Besides the severity of the disease, there are also other factors that have been earlier identified as a risk for insufficient information and education in asthma. These include age (65 years or more), male sex, long history on medication and new medicines (Närhi *et al.* 2001, Barber *et al.* 2004, Puumalainen *et al.* 2005). However, this is contradictory to expectations, since it could be expected that in association to medication changes the patient would receive more information. Structured and motivational asthma information and education programs should be brought into use. Such protocols can successfully be delivered by pharmacies, as shown in numerous studies (Närhi *et al.* 2001, Fathima *et al.* 2013, Ottenbros *et al.* 2014). For better allocation of resources, pharmacies would also benefit from validated screening tools to identify patients with specific need of information and education. These tools are already available but their use should be implemented in daily practice (LeMay *et al.* 2014, Naik-Panvelkar *et al.* 2015). Further, eHealth

solutions should be rigorously developed and implemented to ensure availability and affordability of information and education for this patient population.

One limitation of the current study was the absence of the Internet as a source of information and education in the earlier Allergy Barometer questionnaire. It is likely, however, that the responders interpreted the alternative “Books, journals etc.” broadly enough and the Internet-delivered information was included.

This study included relatively small number of the MSI patients which was a limitation, too. However, the sample is representative as its MSI/LSI patients ratio is in line with earlier asthma barometer studies (Kauppi *et al.* 2015). Further, a visual analogue scale or a numerical rating scale might have given a more precise results on amount of given information (Salo *et al.* 2016). Recall bias, on the other hand, may have an impact on the results. Thus, it is possible that amount of given information is larger and it is offered more often to the patients than reported here.

One of the achievements of the Finnish National Asthma Programme (FNAP) was a consensus on the task division and collaboration between physicians, nurses and pharmacists regarding the information and education for patients with asthma (Haahtela *et al.* 2006). When physicians and nurses educated patients for asthma and guided self-management, pharmacy personnel focused more on inhalation technique and proper use of devices. Since the launch of the National Guidelines emphasizing guided self-management, the morbidity and mortality due to asthma have decreased (Haahtela *et al.* 2006). This might explain the relatively small proportion of MSI patients in this study which is in line with the overall significant decrease of self-reported asthma severity within the last decade, as demonstrated by earlier Finnish studies (Browatzki *et al.* 2009, Pallasaho *et al.* 2011, Kauppi *et al.* 2015).

CONCLUSIONS

Pharmacy personnel is a significant source of information and education for asthma patients. This role should be strengthened by introducing new tools and practice support for pharmacies especially considering the enlarging group of drugs and inhalers for asthma patients in the recent years. It is important to continuously pay attention to proper education for guided self-management and to further improve sources for asthma information and education in order to achieve good asthma control.

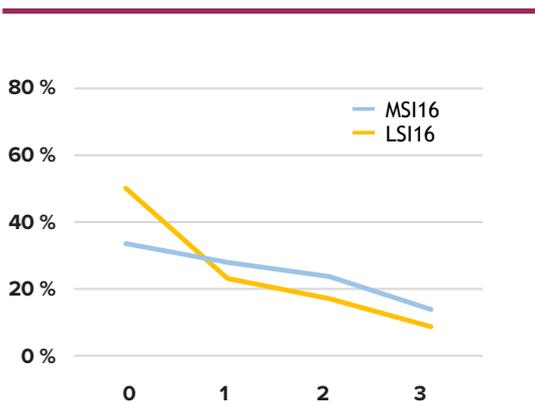


Figure 3. The internet as an information source for asthma and asthma medication reported MSI and LSI asthma patients (LSI) in 2016. 0 = no information, 1= some information, 2= quite a lot, 3 = a lot of information.

TIIVISTELMÄ

Onko apteekkien henkilökunnan rooli merkittävä astmaa sairastavien lääkeohjauksessa?

→ Sirpa Peura

Proviisori,
Suomen Farmasialiitto, Helsinki

→ Juha Jantunen

FM,
Allergia-, Iho- ja Astmaliitto ry, Helsinki

→ Johanna Salimäki

Proviisori,
Suomen Farmasialiitto, Helsinki

→ Lellu Leinonen

Proviisori,
Suomen Farmasialiitto, Helsinki

→ Tari Haahtela

Prof. emeritus,
Tulehduskeskus, Iho- ja allergiasairaala,
Helsingin yliopisto

→ Paula Kauppi*

Lääkäri, FT,
Tulehduskeskus, Iho- ja allergiasairaala,
Helsingin yliopisto, paula.kauppi@hus.fi

*Kirjeenvaihto

Taustaa: Tämän tutkimuksen tavoitteena oli selvittää, kuinka potilaat saavat tietoa ja ohjausta astmaan ja astmalääkkeisiin.

Aineisto ja menetelmät: Aineisto koostuu kahdesta kyselystä, jotka kumpikin toteutettiin apteekkeissa yhden viikon aikana syyskuussa 2010 ja syyskuussa 2016. Tutkimukseen vastasi 1 207 henkilöä vuonna 2010 ja 956 henkilöä vuonna 2016. Vastaajilta kysyttiin, mistä he olivat saaneet tietoa astmasta ja astmalääkkeistä (lääkäriltä, hoitajalta, apteekista, potilasyhdistyksiltä, kursseilta tai kirjoista ja lehdistä) ja kuinka paljon he olivat saaneet tietoa astmasta. Potilaat jaettiin vaikeaa astmaa sairastaviin (päivystyskäynti tai sairaalahoito astman vuoksi) ja lievempää astmaa sairastaviin (muut astmapotilaat).

Tulokset: Vaikeaa astmaa sairastavat saivat useimmin tietoa lääkäriltä (60 %), apteekkeista (55 %) tai hoitajilta (45 %). Apteekit jakoivat tietoa tasaisemmin vaikeaa astmaa sairastaville ja lievää astmaa sairastaville. Tutkimuksen tulosten mukaan 7 prosenttia vaikeaa astmaa sairastavista ja 21 prosenttia lievää astmaa sairastavista eivät kokeneet saaneensa tietoa sairaudesta lääkäriltä, hoitajalta eikä apteekista.

Johtopäätökset: Apteekkien henkilökunta jakaa tietoa astmalääkkeistä säännöllisesti, ja tätä pitäisi edelleen lisätä. Vaikka suurin osa astmaa sairastavista oli saanut tietoa astmasta ja astmalääkkeistä, silti noin joka viides koki, ettei saanut mitään tietoa. On tärkeää jatkuvasti kiinnittää huomiota ohjatun omahoidon neuvontaan ja edelleen parantaa astman hoito-ohjeiden saatavuutta hyvän astman hallinnan saavuttamiseksi.

Avainsanat: apteekki, astma, farmaseutti, lääke, lääkeohjaus

REFERENCES

- Barbanel D, Eldridge S, Griffiths C: Can a self-management programme delivered by a community pharmacist improve asthma control? A randomized trial. *Thorax* 58: 851–854, 2003
- Barber N, Parsons J, Clifford S, Darracot R, Horne R: Patients' problems with new medication for chronic conditions. *Qual Saf Health Care* 13: 172–175, 2004
- Browatzki A, Ulrik CS, Lange P: Prevalence and severity of self-reported asthma in young adults. *Eur Respir J* 34: 1046–1051, 2009
- Bunting BA, Cranor CW: The Asheville Project: long-term clinical, humanistic and economic outcomes of a community-based medication therapy management program for asthma. *J Am Pharm Assoc* 46: 133–147, 2003.
- Cordina M, McElnay JC, Hughes CM: Assessment of a community-based program for patients with asthma. *Pharmacotherapy* 21: 1196–1203, 2001
- Diamond SA, Chapman KR: The impact of a nationally coordinated pharmacy-based asthma education intervention. *Can Respir J* 8: 261–265, 2001
- Fathima M, Naik-Panvelkar P, Saini B, Armour CL: The role of community pharmacists in screening and subsequent management of chronic respiratory diseases: a systematic review. *Pharm Pract (Granada)* 11: 228–245, 2013
- Gregoriano C, Dieterle T, Breitenstein AL, et al.: Use and inhalation technique of inhaled medication in patients with asthma and COPD: data from a randomized controlled trial. *Respir Res* 19: 237, 2018, doi: 10.1186/s12931-018-0936-3
- Haahtela T, Tuomisto LE, Pietinalho A, et al.: A 10 year asthma programme in Finland: major change for the better. *Thorax* 61: 663–670, 2006
- Jantunen J, Haahtela T, Salimäki J, Pelkonen A, Mäkelä M, Kauppi P: Asthma and allergy are becoming less severe in Finland – pharmacy barometer surveys in 2010 and 2016. *Finnish Medical Journal* 73: 367–380, 2018
- Kauppi P, Peura S, Salimäki J, Järvenpää S, Linna M, Haahtela T: Reduced severity and improved control of self-reported asthma in Finland during 2001-2010. *Asia Pac Allergy* 5: 32–39, 2015, doi: 10.5415/apallergy.2015.5.1.32
- LeMay KS, Armour CL, Reddel HK: Performance of a brief asthma control screening tool in community pharmacy: a cross-sectional and prospective longitudinal analysis. *Prim Care Respir J* 23: 79–84, 2014, doi: 10.4104/pcrj.2014.00011
- Naik-Panvelkar P, Saini B, LeMay KS, et al.: A pharmacy asthma service achieves a change in patient responses from increased awareness to taking responsibility for their asthma. *Int J Pharm Pract* 23: 182–191, 2015, doi: 10.1111/ijpp.12134
- Närhi U, Airaksinen M, Enlund H: Do asthma patients receive sufficient information to monitor their disease – a nationwide survey in Finland. *Pharm World Sci* 23: 242–245, 2001
- Ottenbros S, Teichert M, de Groot R, et al.: Pharmacist-led intervention study to improve drug therapy in asthma and COPD patients. *Int J Clin Pharm* 36: 336–344, 2014, doi: 10.1007/s11096-013-9887-4
- Pallasaho P, Juusela M, Lindqvist A, Sovijärvi A, Lundbäck B, Rönmark E: Allergic rhinoconjunctivitis doubles the risk for incident asthma-results from a population study in Helsinki, Finland. *Respir Med* 105: 1449–1456, 2011
- Puimalainen II, Kause JM, Airaksinen MS: Quality assurance instrument focusing on patient counseling. *Ann Pharmacother* 39: 1220–1226, 2005
- Salo T, Peura S, Salimäki J, Maasilta P, Haahtela T, Kauppi P: Need for medication and stuffy nose predict the severity of allergic rhinitis. *Asia Pac Allergy* 6(2):133–135, 2016, doi:10.5415/apallergy.2016.6.2.133
- Schulz M, Verheyen F, Muhlig S, et al.: Pharmaceutical care services for asthma patients: a controlled intervention study. *J Clin Pharmacol* 41: 668–676, 2001

Sinclair BL, Clark DW, Sears MR: How well do New Zealand patients understand and manage their asthma? A community study. *N Z Med J* 100 (835): 674–677, 1987

Stanford RH, Averell C, Parker ED, Blauer-Peterson C, Reinsch TK, Buikema AR: Assessment of adherence and asthma medication ratio (AMR) for a once-daily and twice-daily inhaled corticosteroid/long acting beta agonist (ICS/LABA) for asthma. *J Allergy Clin Immunol Pract* pii: S2213–2198(19)30001-7, 2019, doi: 10.1016/j.jaip.2018.12.021

