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Impact of Pharmacist Provided Patient Education on Knowledge, Attitude, Practice and Quality of Life in Asthma Patients in a South Indian Hospital

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In many south Indian hospital, patient education by a clinical pharmacist is almost nil. The aim of this study was to assess the impact of patient education on Knowledge, Attitude, Practice (KAP) and Health Related Quality of Life (HRQoL) in asthmatics. The study also aimed to develop and validate the KAP questionnaire for asthma in south Indian set-up. Patients (n = 297) were educated on monthly basis for a period of 6 months using Global Initiative for Asthma recommended pocket guide. Impact of patient education was assessed by comparing the baseline and end visit KAP scores. On every follow-up visit, patient's HRQoL was measured using Saint George Respiratory Questionnaire (SGRQ). The standardized cronbach's alpha value was 0.81. The test-retest reliability was 0.89. A significant (p<0.05) improvement of KAP score was observed with respect to baseline characteristics. A significant improvement (p<0.05) in all the domains of the SGRQ score was observed from day 30 onwards. The developed KAP questionnaire was acceptable and culture fair in the tested population. Pharmacist provided patient education significantly improved patient's KAP and HRQoL.

Key words: Asthma, knowledge, attitude, practice, patient education

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INTRODUCTION

Asthma is one of the most severe chronic diseases affecting an individual's Quality of Life (QoL). Though the advances made in the management of the disease, morbidity and mortality are still continuing to rise worldwide (Rajanandh *et al.*, 2013). The goals of asthma therapy are to maintain near normal lung function, no activity limitations and no episodes of worsening asthma. However many patients could not attain these goals though they are under treatment and resulting in poor QoL. This is mainly because there is a gap between what actually physician recommended and what is in actual practice by the patients. This gap is due to poor knowledge and attitude about asthma (Rajanandh *et al.*, 2014a; Garcia-Cardenas *et al.*, 2013).

Educating the patients about their disease and medications will improve their knowledge, attitude towards disease, practice towards management and improve patients QoL (Basheti *et al.*, 2005; Rajanandh *et al.*, 2014b). Studies have shown that inadequate knowledge is identified as one of the leading causes influencing the adherence behavior (Bender, 2002). Current treatment guidelines for asthma emphasize the importance of patient education (GINA, 2012). However, in south Indian hospital, patient education by a trained clinical pharmacist is almost nil.

Patient education is an important aspect in the Indian setup since most of the patients are illiterate and having low socioeconomic status (Carter and van Mil, 2010). With this background, It was aimed to educate the patients and to measure their Knowledge, Attitude, Practice (KAP) and Health Related Quality of Life (HRQoL). Unfortunately, there is paucity or no validated KAP questionnaire for asthma in south Indian set-up. As a part of the study, knowledge, attitude, practice questionnaire for asthma was developed and validated.

METHODOLOGY

The study was conducted at the pulmonary medicine department in SRM Medical College Hospital and Research Center, SRM University, Tamilnadu, India. The study has got Institutional ethics committee approval (270/IEC/2012) and registered in the clinical trial registry in India (CTRI/2012/08/002915). Written consent was obtained from all the study patients.

Item generation: About a 15-item questionnaire were constructed. The development process began by identifying relevant content areas. The content of the questionnaire was developed by the research team of this

project. An extensive literature review was carried out by the team to retrieve already published instruments and to identify the common domains. After the review of literature, the research team decided to include three domains namely knowledge domain, attitude domain, practice domain and each domain consisted of five questions to assess the patient's knowledge and attitude about their disease and practice on disease management. Items were derived based on the comprehensiveness, avoiding obvious redundancy and balance of domains represented.

Item review: The rationale of KAP questionnaire was reviewed by a panel of experts namely pulmonologists, clinical pharmacologists, language and public health experts. Pulmonologists and clinical pharmacologists provided their comments on the lucidity and comprehensiveness of the items and relevance to pulmonary education. External educationalists were asked to rate the relevance of each item by marking 'not relevant' to 'very relevant' on the scale. A content validity ratio was then calculated for each item and the value higher than 0.78 was considered satisfactory (Lawshe, 1975).

Questions about knowledge were corresponding to patient's awareness of disease, part of the body affected, causative factors, symptoms and physiological changes during asthma. Second part of this questionnaire was about patient's attitude on the curability of the disease, convenient dosage form, continuation of medications, opinion on self-adjustment of doses and contagiousness of disease. Patient's practice of disease management was assessed by questions regarding their habit of carrying medications, inhalation techniques followed, dosage timings, avoiding food items and involving in activities which might exacerbate asthma.

Validation of questionnaire: The developed questionnaire was translated from the source language English to the target language Tamil which is the local language in Tamilnadu. The translation was done independently by two language experts in the target language. The two translated versions were then reviewed by an expert group constituted by two pulmonologists proficient in both the languages, a language expert and the investigator. The translated versions were compared with original English version and a consensus Tamil translated version was made by the expert group incorporating appropriate changes.

The final translated version was then translated back into the source language English with the help of two other experts proficient in both the languages

independently. The two back translated English versions were then compared with the original English version by the expert group for conceptual and cultural equivalence. Appropriate changes were made in the final translated Tamil version to minimize ethnocentric bias and to make it clear, user friendly and unambiguous. Finally the proof reading was ensured by no typing, spelling or grammatical mistakes remain in the final Tamil version. Internal consistency and test-retest reliability were performed to evaluate the validation procedure (Rajanandh *et al.*, 2014c).

Quality of life: Health Related Quality of Life (HRQoL) was assessed by means of Saint George Respiratory Questionnaire (SGRQ). It is a disease specific instrument designed to measure the impact of overall health, daily life and perceived well being. The 76 items available in this questionnaire with 3 domains and total scores like, symptoms, activity and impact (social functioning, psychological disturbances resulting from airways disease) were answered by the study patients.

Each item was measured based on empirical data. Scoring ranged from 0 to 100 with higher scores indicating poor health. The SGRQ was scored according to the developer's guidelines. The original language (English-United Kingdom) and Tamil versions of the questionnaire were used with prior permission from the concerned authors.

Patient education: In the usual practice, patients receive a general counseling from the physicians or their assistants. Apart from these, a patient education material recommended by the GINA which is available as 'Patient guide' was used in educating the study patients in all their clinic visits (GINA, 2012). The impact of education on study patients was compared between the baseline and end visit KAP report. All the patients were educated on day 0 (visit 1), 30, 60, 90, 120, 150 and 180 (end visit). The impact of patient education was assessed by comparing the baseline and end visit KAP score.

Statistical analysis: Cronbach's α coefficient was calculated in SPSS. Data was expressed in median and interquartile range. Kruskal-Wallis one-way analysis of variance was used to compare the baseline, end visit KAP scores and association across the baseline characteristics. The SGRQ scores were plotted as median and 95% CI.

RESULTS

Demography: A total of 297 patients completed the study. Baseline characteristics were shown in Table 1. The mean

age of patients in the study was 37.6 years (± 16.04) with almost equal gender distribution (Male, 51.6%; Female, 48.6%).

Validation parameters: We measured the time required to complete the KAP questionnaire in a subset of participants and the mean measured run-time was about 12 min (12.0 ± 3.0). The median visit interval between the test and retest was 10 days (Range, 1-19 days). The test-retest reliability was 0.89 (Range 0.72-0.96), indicated a high reliability. Almost all items had acceptable to excellent consistency with a Cronbach's alpha 0.81 (Range, 0.71-0.97).

Quality of life: At baseline, no statistically significant ($p < 0.05$) difference between the any of the HRQoL domains. A significant improvement ($p > 0.05$) in all the domains of the SGRQ score was observed from day 30 onwards (Fig. 1). The overall SGRQ score portrayed that HRQoL was well improved in all the groups statistically ($p < 0.05$).

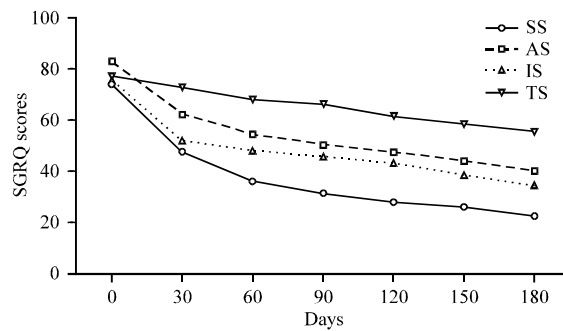


Fig. 1: SGRQ scores in all the domains at various time interval, SS: Symptom score, AS: Activity score, IS: Impact score and TS: Total score

Table 1: Baseline characteristics of study participants

Variables	Mean \pm SD (n = 297)	
	No.	%
Age (in years)	38.37 \pm 14.87	
Male	152	51.17
Female	145	48.82
Age at asthma onset (in years)	31.42 \pm 8.96	
Duration of asthma (in years)	6.64 \pm 6.67	
Smoking history		
Smoker	59	19.86
Past smoker	16	5.38
Passive smoker	12	4.04
Non smoker	210	70.70
Educational status		
Professional degree	5	1.68
Graduate/Postgraduate	6	2.02
Intermediate/Diploma	6	2.02
High school	78	26.26
Middle school	108	36.36
Primary school	60	20.20
Illiterate	34	11.44

Table 2: Knowledge assessment of study population

Questions	Baseline (%) (n = 297)	End visit (%) (n = 297)	Improvement (%) (n = 297)
Knowledge assessment			
Can you name the disease you are suffering?	69	100	31
What are the symptoms of your disease?	46	93	47
Can you name which part of the body is affected?	33	98	65
Rescue medicines	19	86	67
Do you know the causative/ worsening factors of your disease?	23	94	71
Attitude assessment			
Can your disease be cured or controlled?	13	98	85
Can you adjust dose of the medications according to your symptoms/cost?	32	96	64
Is your disease contagious?	65	98	35
For your disease condition, can you do breathing exercise	62	96	34
Is your disease fatal?	60	98	38
Practice assessment			
If you are prescribed with medicines for one month	47	97	50
Do you take medicine at the exact time as prescribed?	84	100	16
Can you go for doubling the dose if a dose is missed?	36	100	64
Will you avoid taking ice cold drinks or cold foods?	31	93	62
If you are not having asthma symptoms	48	98	50

Patient education: Patient education was either in one to one method or group counseling method. One to one counseling was given as and when the patients visiting the study site. In group counseling method, patients were called on a particular day, apart from their scheduled study visits and were taught by the study team members.

The following subjects were dealt in educating the patients i.e., nature of asthma disease, causative factors and preventive measures of asthmatic attacks, needed lifestyle changes for asthmatic person, medications usage, how to get help in case of emergencies and method of using peak flow meters for monitoring lung functions. The assessments of KAP results given in Table 2 showed that patient education resulted in better improvements in knowledge, attitude and practice of patients when compared to baseline values.

The association between KAP score and baseline characteristics was summarized in Table 3. In baseline score of the male population was higher than female population. At the end visit, a significant ($p < 0.05$) improvement of KAP score was observed in both the gender. Baseline knowledge, attitude, practice score of the patients who were 61 years of age were less when compared with 40 and 41-60 years. A trend of gradual increase in baseline KAP score was observed when education level increases. However, statistically significant ($p < 0.05$) improvement in KAP score was observed in all the age groups and in all the level of education at end visit.

DISCUSSION

The prevalence of asthma steadily increased over the later part of the last century, first in the developed

Table 3: Association between KAP scores and baseline characteristics

Baseline characteristics	Baseline (n = 297)	End visit* (n = 297)
Gender		
Male	7.70 4.64, 10.92	13.60 8.64, 24.45
Female	6.98 3.75, 9.52	12.76 8.45, 23.68
Age (in years)		
≤40	7.14 4.15, 10.50	13.86 8.98, 24.86
41-60	6.84 3.50, 9.86	13.44 8.42, 24.20
≥61	5.65 2.50, 8.75	12.66 8.32, 23.28
Education		
Professional degree	8.62 5.75, 11.80	15.00 10.25, 30.00
Graduate/Postgraduate	8.12 5.50, 11.50	15.00 10.25, 30.75
Intermediate/Diploma	7.90 4.75, 10.80	14.36 9.50, 28.48
High school	7.62 4.15, 10.25	14.16 9.35, 28.25
Middle school	6.45 3.46, 9.64	13.54 8.56, 24.28
Primary school	6.42 3.28, 9.58	13.25 8.25, 24.25
Illiterate	5.45 2.50, 8.25	12.35 8.25, 23.15

Data expressed as median and interquartile range. *Significant at < 0.05 level compared with baseline

country and then in the developing country like India. The overall burden of asthma in India is estimated at more than 15 million patients (Rajanandh *et al.*, 2014d; Jindal, 2007). Asthma can place considerable limitations on the physical, social, emotional and professional lives of the patients, with substantial negative impact on QoL. All these problems can be dramatically reversed through patient education especially by a clinical pharmacist (De Sousa *et al.*, 2013).

In many countries, clinical pharmacy services are still in the budding stage, with pharmacists spending a predominant amount of time on distributive and manufacturing activities. In India, pharmacy practice is still in its infancy. The clinical pharmacist's contribution to patient care through education is an approach being advocated to optimize drug therapy and improve patient's QoL.

Education programs have enhanced the knowledge of asthma, pulmonary functions, the control of the disease and treatment compliance and they should be assimilated into patient care (Guevara *et al.*, 2003; Lahdensuo *et al.*, 1996). The improvement of such knowledge, attitude and practice towards management are one of the main objectives of education programs and its assessment is an important part of the intervention (Allen and Jones, 1998). Many asthma education programs use validated questionnaires to measure patient knowledge, the impact of the programs and the relationship between such knowledge and asthma control (Saldana *et al.*, 2007).

Validated questionnaires are available in a number of languages, such as English, French, Portuguese and Spanish, but not in Tamil. In addition, the knowledge of asthma differs among the various cultures and countries and specific questionnaires and programs should therefore be developed to meet different needs (Bailey *et al.*, 2009; Lee *et al.*, 2007; Malone *et al.*, 2008). In this study, knowledge, attitude, practice of asthma patients were assessed using KAP questionnaire. The developed questionnaire is reliable and culture fair. The results of KAP in the present study suggest that the patients at the baseline had poor knowledge, attitude and practice about asthma and its management. After patient education, at the end visit, the percentage change of KAP was increased when compared with baseline values. This percentage improvement in KAP is due to pharmacist provided patient education.

Though KAP assessment was accepted by many researchers in studying the impact of educational intervention, this is the first study of its kind in south Indian set-up. We did not have any similar studies in our population to compare our results. In a study carried out by Yang *et al.* (2003) reported that education program significantly improved the knowledge as well as quality of life scores in asthma patients. Similar findings were observed by Boulet *et al.* (1995) and Yamaoka *et al.* (2002) in their studies.

In contrast, Abdulwadud *et al.* (1999) reported that a limited asthma education program in a hospital outpatient

setting had a positive impact on patient's knowledge of asthma, but not on their QoL, self-management skills or attitudes and beliefs about asthma. The reason would be that the patients on their study were educated only at the beginning of the study and not in the follow-up visits. Meszaros *et al.* (2003) suggested that it is necessary to provide patient education on a regular and on-going basis to achieve permanent improvements.

Gallefoss *et al.* (1999) studied the QoL assessment after patient education in a randomized controlled study on asthma and COPD. A major limitation in the design of this study was that the participants were not examined with the SGRQ before entering the survey. Hence, the authors could only observe differences in QoL scores between pre and post education. This demerit was overcome in the present study by educating the patients on monthly basis and measuring the SGRQ scores every month.

As occur in many other countries worldwide, asthma patients in south India are afraid of taking corticosteroid medications (Chandler *et al.*, 1986; Van der Palen *et al.*, 1997; Narhi *et al.*, 1999). This is merely because of wrong beliefs about the safety of corticosteroids. It is well known that even the most appropriate treatment strategy will fail if the patient has an uncooperative attitude. In the present study, patients were not only taught with the validated educational material but also counselled and corrected their misconception about the disease or medications.

Although a number of asthma knowledge questionnaires have been developed, this was the first study to construct a specific questionnaire in Tamil. Obviously, we could have translated an existing questionnaire. However, translating a questionnaire is might not be suitable for all populations, since medical terminology and practices, as well as knowledge about asthma, differ among populations.

CONCLUSION

In conclusion, our 15-item questionnaire is a valid and reliable instrument for measuring asthma knowledge in adults with asthma in developing countries where Tamil is spoken. As the first study of this nature in south Indian hospital ambulatory settings, the concept of patient education achieved improvement in patient's Knowledge, Attitude, Practice and Quality of Life. Provision of patient education by the clinical pharmacist was well received and encouraged by the patients and the medical fraternity.

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