

Short Communication

Impact of pharmacist-led interventions on asthma patients' knowledge, attitudes and self-efficacy: single-blind randomised controlled trial

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Abstract

Objectives Asthma is a common chronic disease and education is a critical component of chronic disease management. This study assessed the impact of pharmacist-led educational interventions on asthma patients' knowledge, attitudes and self-efficacy.

Methods This single-blind, three-arm, prospective, randomized, controlled and parallel group study was conducted in the Respiratory Units of University of Nigeria Teaching Hospital, Enugu State and the Lagos University Teaching Hospital, Lagos State between March 2016 and September 2017. The three arms, in a 1 : 1 : 1 ratio, were: Usual Care, Individual Intervention and Caregiver-assisted Intervention. The Intervention arms received education, to varying degrees, for six months. The Usual Care arm received no education. The Knowledge, Attitude and Self-Efficacy-Asthma Questionnaire was filled at baseline, three months and six months. Data were analysed using the IBM SPSS Version 25.0 with statistical significance set as $P < 0.05$.

Key findings Seventy-eight (78) asthma patients participated; 39 per hospital; 13 in each arm. Patients in both Intervention arms possessed significantly better asthma knowledge compared to Usual Care at three months (13.73 versus 5.88, $P < 0.001$ /12.81 versus 5.88, $P < 0.001$) and six months (14.31 versus 5.77, $P < 0.001$ /13.23 versus 5.77, $P < 0.001$). Only the Individual Intervention arm demonstrated significantly better attitudes (84.92 versus 79.77; $P = 0.047$) and self-efficacy (86.12 versus 80.73, $P = 0.006$) compared to Usual Care at three months and six months, respectively.

Conclusions These findings highlight the importance of educating patients directly, as much as possible.

Keywords: asthma; attitudes; knowledge; pharmacist-led interventions; self-efficacy

Introduction

The management of chronic airways disease is 10% medication and 90% education.^[1, 2] Caregivers can assist asthma patients with the identification and avoidance of triggers, recognition of symptoms, administration of medications and accessing emergency care.^[3, 4] Thus, educating asthma patients and/or their caregivers could be helpful.

More evidence for pharmacist-led interventions to improve asthma outcomes are needed. Most studies designed to test interventions in asthma were conducted in Western countries. This study was conducted in Nigeria to assess the impact of pharmacist-led interventions on asthma patients' knowledge, attitudes and self-efficacy.

Methods

This single-blind, three-arm, prospective, randomized and controlled study was conducted in the Respiratory Units of the Department of Medicine, University of Nigeria Teaching Hospital (UNTH), Enugu State and the Lagos University Teaching Hospital (LUTH), Lagos State between March 2016 and September 2017.

Eligible participants were randomised into one of the three arms: Usual Care, Individual Intervention and Caregiver-assisted Intervention in a 1 : 1 : 1 ratio. Participants were oblivious of the arms they fell into but the health professionals were informed.

Patients in the Usual Care arm received hospital standard care, with no active participation by the pharmacist researchers.

Patients in the Individual and Caregiver-assisted arms were educated on asthma prevalence, asthma triggers, types of inhalers, asthma control, handling of asthma attacks, asthma reviews during and outside clinic visits. Phone calls and text messages were utilized for educating the patients outside clinic visits. The education scheme was the same for both Intervention arms. However, the patients' choice caregivers were educated in the Caregiver-assisted Intervention arm.

Text messages were sent once weekly (seven-day interval), from the first day of recruitment. Phone calls were made 3–4 days after text messages were sent, to buttress the messages and discuss grey areas. All patients had access to the telephone numbers of the pharmacist researchers. Only patients in the Intervention arms received text messages and follow-up calls without solicitation.

At baseline, patient-specific data were collected. Data were maintained with confidentiality. The Knowledge, Attitude and Self-Efficacy Asthma Questionnaire (KASE-AQ) was filled at baseline and during follow-up interviews at 3 months and 6 months.^[5] All patients had six-months participation time.

Eligible participants were those with confirmed asthma diagnosis by a physician, no concurrent respiratory disease, 16 years old and above, able to communicate in oral and written English, willing to complete follow-up questionnaires, telephone access, non-pregnant/non-lactating women and no psychiatric barrier. Eligible patients within a year of recruitment who gave consent for participation were included in time-driven study.

Ethical approval was obtained from the Health Research and Ethics Committee of UNTH and LUTH. Patients provided both written and oral consents, before participation.

A pro forma was utilized to collect patient-specific data. The KASE-AQ comprised three domains. Permission was received to utilize the instrument and scoring instructions.

Data were analysed using the IBM SPSS Version 25.0. Descriptive statistics were used to summarize data. Inferential statistics such as Pearson's Chi-Square test and paired *t*-test were used, where applicable, with statistical significance set as $P < 0.05$.

Results

One hundred and one (101) patients were assessed for eligibility in both hospitals, 78 were randomised, 39 patients per hospital, 13 patients per arm of each hospital. Two patients relocated outside the study state while one voluntarily withdrew. All dropouts were replaced. These are indicated in Figure 1.

More than half of the participating asthma patients were women (61.5%). Most of the patients (79.5%) utilized domestic fuel, described as the use of kerosene stove, kerosene lantern or generator set. More details are presented in Table 1.

The knowledge of asthma was significantly higher for both Intervention arms compared to Usual Care at three months and six

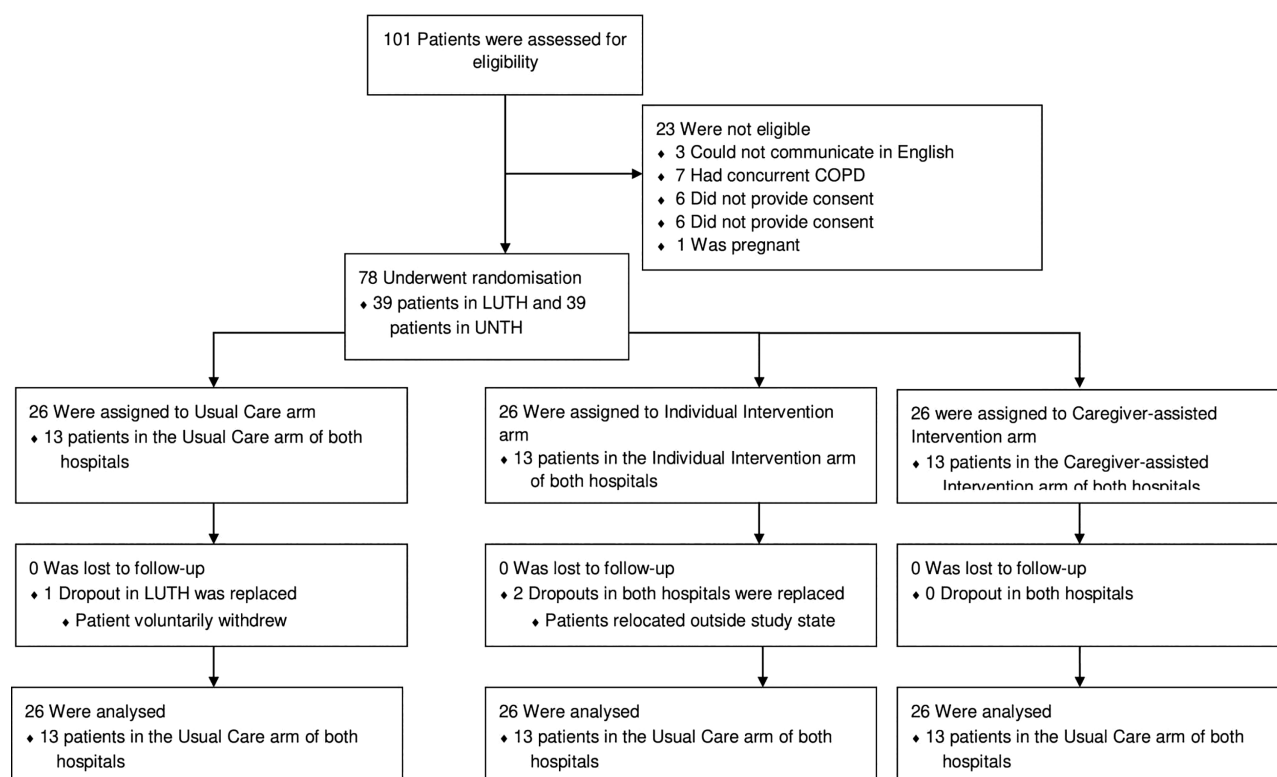


Figure 1 Consolidated standards of reporting trials (CONSORT) flow diagram.

Table 1 Demographic details of the asthma patients, *N* (number of physical contacts) = 234^[6]

Independent variables	LUTH	UNTH	Total	P-value
Gender	$\chi^2 (1, N = 234) = 2.600$			0.107
Male	51 (43.6)	39 (33.3)	90 (38.5)	
Female	66 (56.4)	78 (66.7)	144 (61.5)	
Age (in years)	$\chi^2 (6, N = 234) = 27.106$			*0.001
16–20	9 (7.7)	15 (12.8)	24 (10.3)	
20–29	6 (5.1)	21 (17.9)	27 (11.5)	
30–39	15 (12.8)	18 (15.4)	33 (14.1)	
40–49	15 (12.8)	15 (12.8)	30 (12.8)	
50–59	42 (35.9)	30 (25.6)	72 (30.8)	
60–69	9 (7.7)	15 (12.8)	24 (10.3)	
≥ 70	21 (17.9)	3 (2.6)	24 (10.3)	
Home domestic fuel use	$\chi^2 (1, N = 234) = 0.944$			0.331
Yes	96 (82.1)	90 (76.9)	186 (79.5)	
No	21 (17.9)	27 (23.1)	48 (20.5)	
Economic status	$\chi^2 (3, N = 234) = 23.194$			*0.001
Low class	3 (2.6)	3 (2.6)	6 (2.6)	
Middle class	111 (94.9)	90 (76.9)	201 (85.9)	
Upper class	3 (2.6)	3 (2.6)	6 (2.6)	
I won't say	0 (0.0)	21 (17.9)	21 (9.0)	
Prior peak flow meter training	$\chi^2 (1, N = 234) = 1.671$			0.196
Yes	9 (7.7)	15 (12.8)	24 (10.3)	
No	108 (92.3)	102 (87.2)	210 (89.7)	
Cigarette smoking history	$\chi^2 (1, N = 234) = 3.162$			0.075
Yes	3 (2.6)	9 (7.7)	12 (5.1)	
No	114 (97.4)	108 (92.3)	222 (94.9)	
Highest education received	$\chi^2 (3, N = 234) = 12.689$			*0.005
Post-SSCE	72 (61.5)	66 (56.4)	138 (59.0)	
SSCE	45 (38.5)	39 (33.3)	84 (35.9)	
FSLC	0 (0.0)	9 (7.7)	9 (3.8)	
No formal education	0 (0.0)	3 (2.6)	3 (1.3)	
Occupation	$\chi^2 (7, N = 234) = 43.649$			*0.001
Civil servant	12 (10.3)	39 (33.3)	51 (21.8)	
Health worker	6 (5.1)	3 (2.6)	9 (3.8)	
Self-employed	39 (33.3)	18 (15.4)	57 (24.4)	
Unemployed	6 (5.1)	3 (2.6)	9 (3.8)	
Private company	9 (7.7)	9 (7.7)	18 (7.7)	
Retiree	24 (20.5)	9 (7.7)	33 (14.1)	
Student	12 (10.3)	33 (28.2)	45 (19.2)	
Engineer	9 (7.7)	3 (2.6)	12 (5.1)	

**P* < 0.05 = statistically significant

months. The attitude towards asthma was significantly higher for the Individual Intervention compared to Usual Care (85.42 versus 79.23; *P* = 0.020, *t* = 2.49) and the Caregiver-assisted Intervention compared to Usual Care (85.42 versus 79.23; *P* = 0.007, *t* = 2.95) at six months. However, the difference between means was only significant for the Individual Intervention compared to Usual Care at three months (84.92 versus 79.77; *P* = 0.047, *t* = 2.09). The self-efficacy in asthma was only significantly higher in the Individual Intervention compared to Usual Care at six months (86.12 versus 80.73; *P* = 0.006, *t* = 3.03). See Table 2.

Discussion

This study revealed that the individualized educational interventions produced better improvements in the patients' knowledge, attitudes and self-efficacy in asthma than the caregiver-assisted interventions.

The mean knowledge of asthma was significantly higher for both Individual and Caregiver-assisted Interventions compared to Usual Care at three months and six months. Similarly, individualized pharmacist interventions improved asthma knowledge and asthma action plan ownership among Australian patients who were followed-up for 12 months.^[7]

The mean attitude towards asthma was significantly higher for both the Individual and Caregiver-assisted Interventions compared to Usual Care at six months. However, the difference between means was only significant for the Individual Intervention compared to Usual Care at three months suggesting that to positively influence the attitudes of asthma patients, Individual Interventions are preferred. Healthcare professionals can maximize clinic visits to achieve this.

The mean self-efficacy in asthma was only significantly higher in the Individual Intervention compared to Usual Care at six months. This suggests that to improve self-efficacy in asthma, patients need to be followed-up for longer periods.

Limitations

Few patients came for their asthma review prompting the adoption of an open study where patients were tracked separately. Initially, there was difficulty in 'breaking the ice' as the Respiratory Team in both hospitals were unfamiliar with having pharmacists join them in the Clinic. This brings to the fore, the relevance of interprofessional education and collaboration. The utilization of two tertiary hospitals limits generalizability.

Table 2 Effect of pharmacist-led interventions on knowledge, attitudes and self-efficacy in asthma scores, $n = 26$

Variables	Mean (SD)	Correlation		Mean Difference	t	df	P-value
		r	p				
Individual Intervention versus Usual Care at three months							
Knowledge of asthma scores	13.73 (1.59) versus 5.88 (2.35)	0.451	0.021	7.85	18.463	25	<0.001*
Attitudes towards asthma scores	84.92 (6.02) versus 79.77 (10.32)	0.138	0.532	5.15	2.086	25	0.047*
Self-efficacy in asthma scores	84.69 (5.85) versus 81.54 (7.89)	0.071	0.729	3.15	1.696	25	0.102
Caregiver-assisted Intervention versus Usual Care at three months							
Knowledge of asthma scores	12.81 (2.47) versus 5.88 (2.36)	0.300	0.136	6.92	9.080	25	<0.001*
Attitudes towards asthma scores	84.46 (8.10) versus 79.77 (10.32)	0.181	0.377	4.69	2.009	25	0.056
Self-efficacy in asthma scores	83.19 (9.73) versus 81.54 (7.89)	0.045	0.825	1.65	0.689	25	0.497
Individual Intervention versus Usual Care at six months							
Knowledge of asthma scores	14.31 (1.64) versus 5.77 (2.21)	0.361	0.770	8.54	19.513	25	<0.001*
Attitudes towards asthma scores	85.42 (6.14) versus 79.23 (10.21)	0.147	0.473	6.19	2.494	25	0.020*
Self-efficacy in asthma scores	86.12 (5.38) versus 80.73 (7.69)	0.073	0.722	5.38	3.033	25	0.006*
Caregiver-assisted Intervention versus Usual Care at six months							
Knowledge of asthma scores	13.23 (2.49) versus 5.77 (2.21)	0.179	0.382	7.46	10.529	25	<0.001*
Attitudes towards asthma scores	6.06 (2.29) versus 5.13 (2.36)	0.208	0.379	6.19	2.950	25	0.007
Self-efficacy in asthma scores	84.77 (7.13) versus 80.73 (7.69)	0.073	0.724	4.04	1.897	25	0.069

* $P > 0.05$

Conclusions

The individualized educational interventions produced better improvements in the patients' knowledge, attitudes and self-efficacy in asthma than the Caregiver-assisted interventions.

These findings suggest that patients should be educated directly, as much as possible. Pharmacists should have counselling rooms for addressing the concerns of their patients and identifying those with additional needs. Interprofessional collaborations should be encouraged.

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Author Contributions

KCA was actively involved with the conception and design of the study, analysis and interpretation of data, drafting the manuscript. MJO was actively involved in the design of the study. CVU was actively involved in the design of the study and drafting of the manuscript. KCA and CVU gave final approval of the version to be published.

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Conflict of Interest

The authors declare that they have no conflict of interest.

Data Availability Statement

Original data generated during the course of the study can be made available, on request.

References

- Giraud V, Roche N. Misuse of corticosteroid metered-dose inhaler is associated with decreased asthma stability. *Eur Respir J* 2002; 19: 246–51.
- Fink JB. Inhalers in asthma management: is demonstration the key to compliance? *Respir Care* 2005; 50: 598–600.
- Munzenberger P, Secord E, Thomas R. Relationship between patient, caregiver, and asthma characteristics, responsibility for management, and indicators of asthma control within an urban clinic. *J Asthma* 2010; 47: 41–5.
- Bellin MH, Land C, Newsome A. *et al.* Caregiver perception of asthma management of children in the context of poverty. *J Asthma* 2017; 54: 162–72.
- Wigal JK, Stout C, Brandon M. *et al.* The knowledge, attitude, and self-efficacy asthma Questionnaire. *Chest* 1993; 104: 1144–8.
- Amorha KC, Okonta MJ, Ukwue CV. Impact of pharmacist-led educational interventions on asthma control and adherence: single-blind, randomised clinical trial *Int J Clin Pharm* 2020; <https://doi.org/10.1007/s11096-020-01187-x>.
- Armour CL, Reddel HK, LeMay KS. *et al.* Feasibility and effectiveness of an evidence-based asthma service in Australian community pharmacies: a pragmatic cluster randomized trial. *J Asthma* 2013; 50: 302–9.