Project Title

Effectiveness of Asthma Education: 3arm Randomized Controlled Trial

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Organisation(s) Involved

National Healthcare Group Polyclinics

Healthcare Family Group(s) Involved in this Project

Allied Health, Ancillary Care

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Aims

To compare the effectiveness of three different types of asthma education in improving asthma knowledge, attitudes towards ICS and asthma self management.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Additional Information

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Project Category

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Effectiveness of asthma education: 3-arm randomized controlled trial

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INTRODUCTION

Asthma is a chronic condition that requires long-term self management. Self-management interventions have been shown to reduce healthcare utilisation and improve quality of life[1]. Inadequate knowledge and negative attitudes towards inhaled corticosteroids (ICS) are barriers to effective asthma self-management[2]. Various modalities for patient education have been studied with no clearly superior intervention reported[2].

AIM

To compare the effectiveness of three different types of asthma education in improving asthma knowledge, attitudes towards ICS and asthma self-management.

METHODS

We conducted a 3-arm randomized controlled trial to compare 3 different types of asthma education (N=300).

- Arm A: Scenario-based education (SBE)
  Asthma education tailored to patient responses to specific scenarios
- Arm B: Topic-based education (TBE)
  Asthma education using checklist of asthma topics
- Arm C: Patient information leaflet (PIL) alone
  Asthma Fact Sheet given to patient, no nurse counselling

Inclusion Criteria	Exclusion Criteria
• Adults with physician diagnosed asthma • Aged between 21-75 years old • Ever prescribed asthma preventer	• Pregnant women • Presence of cognitive impairment • Patients with COPD

Study Protocol	Scenario Based (Arm A)	Topic Based (Arm B)	PIL (Arm C)
1st session (15-20min) At recruitment	In-person	In-person	In-person
2nd session (15-20min) 4 weeks later	In-person or telephone consult	In-person or telephone consult	Not applicable
Conducted by	Advance Practice Nurse	Case Manager (Trained nurse)	Research Co-ordinator
Data collection at Study Visit 1 (Baseline)	Socio-demographic MARS-A, ACT, GINA, PAKQ, steroid knowledge & attitude, self-management, QoL	Socio-demographic MARS-A, ACT, GINA, PAKQ, steroid knowledge & attitude, self-management, QoL	Socio-demographic MARS-A, ACT, GINA, PAKQ, steroid knowledge & attitude, self-management, QoL
Data collection at Study Visit 2 (Week 4)	PAKQ, Steroid knowledge & attitude, self-management, PIL feedback.	PAKQ, Steroid knowledge & attitude, self-management, PIL feedback.	PAKQ, Steroid knowledge & attitude, self-management, PIL feedback.
Data Collection at Study Visit 3 (Week 10)	MARS-A, ACT, GINA, PAKQ, steroid knowledge & attitude, self-management, QoL, judgment skill	MARS-A, ACT, GINA, PAKQ, steroid knowledge & attitude, self-management, QoL	MARS-A, ACT, GINA, PAKQ, steroid knowledge & attitude, self-management, QoL

MARS-A: Medication Adherence Reporting Scale – Asthma; ACT: Asthma Control Test; GINA symptom control test; PAKQ: Patient Asthma Knowledge Questionnaire; QoL: Quality of Life

SCENARIOS

Living with Asthma

In the table below, please select with a tick ✓ next to the option that you think is the most appropriate response to each scenario. Choose one option only.

Domain	Scenario	Option A	Option B	Option C	Option D
1. Asthma Control A ☐ B ☐ C ☐ D ☐	You have been experiencing a lot of asthma symptoms and have been using your reliever (blue) inhaler (e.g. Ventolin) more often. How would you assess your asthma control?	(A) I would: - say my asthma is under control because these symptoms are normal for asthma patients. ☐	(B) I would: - say my asthma is under control because my symptoms go away each time I use my reliever inhaler. ☐	(C) I would: - say my asthma is not under control AND - I need to continue using my reliever inhaler regularly to better control my asthma. ☐	(D) I would: - say my asthma is not under control AND - I need additional preventer medication to better control my asthma. ☐
1i. I would like to know more about how to tell if my asthma is under control. Yes ☐ No ☐					
2. Disease and Medication Knowledge A ☐ B ☐ C ☐ D ☐	Preventers are medications which reduce the inflammation in the airways. Relievers (blue inhalers) relax the airway muscles which tighten during an asthma attack. How do you use your inhalers?	(A) I do not use a preventer inhaler I use a reliever daily to prevent asthma symptoms. ☐	(B) I do not use a preventer inhaler I only use a reliever when I get asthma symptoms. ☐	(C) I use: both a preventer inhaler **AND** a reliever only when I get asthma symptoms. ☐	(D) I use: a preventer inhaler daily **AND** a reliever only when I have symptoms. ☐
2i. I would like to know more about asthma medications and how they work. Yes ☐ No ☐					

References

1. Hodkinson A, et al. Self-management interventions to reduce healthcare use and improve quality of life among patients with asthma: systematic review and network meta-analysis. BMJ. 2020 Aug 18;370:m2521.
2. Miles C, Arden-Close E, Thomas M, Bruton A, Yardley L, Hankins M, Kirby SE. Barriers and facilitators of effective self-management in asthma: systematic review and thematic synthesis of patient and healthcare professional views. NPJ Prim Care Respir Med. 2017 Oct 9;27(1):57.
3. Hodkinson A, et al. Self-management interventions to reduce healthcare use and improve quality of life among patients with asthma: systematic review and network meta-analysis. BMJ. 2020 Aug 18;370:m2521

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RESULTS

Table 1. Participants' Characteristics

	Arm A (N=100)	Arm B (N=100)	Arm C (N=100)
Age (Years)			
Mean (SD)	47.2 (12.6)	49.2 (12.6)	51.4 (11.6)
Gender			
Female	64 (64.0%)	63 (63.0%)	56 (56.0%)
Ethnicity			
Chinese	47 (47.0%)	46 (46.0%)	45 (45.0%)
Malay	33 (33.0%)	31 (31.0%)	25 (25.0%)
Indian	15 (15.0%)	20 (20.0%)	21 (21.0%)
Others	5 (5.0%)	3 (3.0%)	9 (9.0%)
Education			
Primary	5 (5.0%)	15 (15.0%)	17 (17.0%)
Secondary	36 (36.0%)	31 (31.0%)	27 (27.0%)
Post-secondary	44 (44.0%)	37 (37.0%)	33 (33.0%)
Tertiary	15 (15.0%)	17 (17.0%)	23 (23.0%)
Working Status			
Working	70 (70.0%)	71 (71.0%)	70 (70.0%)
Not working	30 (30.0%)	29 (29.0%)	30 (30.0%)
Smoking Status			
No - Never	75 (75.0%)	65 (65.0%)	71 (71.0%)
No - Ex-smoker	21 (21.0%)	19 (19.0%)	16 (16.0%)
Yes	4 (4.0%)	16 (16.0%)	13 (13.0%)
Age of asthma diagnosis (years)			
Mean (SD)	19.7 (17.1)	19.7 (15.9)	21.9 (16.5)
Any nebulisation in the last 12 months?			
Yes	5 (5.0%)	11 (11.0%)	12 (12.0%)
Any Emergency Department visit in the last 12 months?			
Yes	5 (5.0%)	6 (6.0%)	12 (12.0%)
Any hospitalisation due to asthma?			
Yes	23 (23.0%)	26 (26.0%)	29 (29.0%)

Table 2. Effectiveness of the 3 interventions

Outcomes	Arm	Baseline	Week 10	Change (Week 10 - Baseline)	Intervention effect (Intervention vs Control) 95% CI (p-value)
Knowledge score Mean (SD)	A	70.5 (10.3)	78.6 (7.7)	**7.7 (9.5)***	**6.3 (4.2 to 8.5) p<0.001**
	B	67.4 (10.1)	74.3 (9.6)	6.5 (9.4)*	4.1 (2.0 to 6.3) p<0.001
	C	67.4 (11.0)	70.1 (10.5)	2.6 (8.3)	Ref.
Attitudes towards inhaled steroid score Mean (SD)	A	27.2 (4.2)	30.5 (4.4)	**3.2 (4.1)***	**1.6 (0.7 to 2.6) p<0.001**
	B	27.0 (4.2)	29.8 (4.1)	2.7 (3.8)*	1.2 (0.2 to 2.1) p<0.05
	C	27.1 (4.7)	28.7 (4.5)	1.6 (4.0)	Ref.
Asthma Self-management Score Mean (SD)	A	4.5 (0.6)	4.7 (0.4)	**0.2 (0.5)**	**0.07 (-0.07 to 0.2) p=0.32**
	B	4.2 (0.7)	4.5 (0.5)	0.3 (0.6)	0.03 (-0.1 to 0.2) p=0.65
	C	4.3 (0.7)	4.5 (0.6)	0.2 (0.6)	Ref.

DISCUSSION

Both scenario-based education (SBE) & topic-based education (TBE) were more effective than PIL alone in improving asthma knowledge and attitudes towards ICS, while improvements in knowledge and attitudes scores were higher in the SBE arm compared to the TBE arm. All 3 patient education strategies improved asthma self-management scores but they were not statistically significantly different.

Limitations:

A longer intervention duration and follow-up period may be required to determine differences in the effectiveness of the interventions in improving asthma self-management[3].

CONCLUSION

Asthma knowledge and attitudes towards ICS improves with asthma education, regardless of modality used. Scenario-based asthma education and topic-based education are effective educational strategies in improving patients' asthma knowledge and attitudes towards ICS.