

# Validation of the Filipino Version of the Written Asthma Action Plan for 5- to 18-year-old Patients

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## ABSTRACT

**Background.** Asthma is a complex disorder characterized by variable and recurring symptoms, airflow obstruction, bronchial hyperresponsiveness, and an underlying inflammation. Asthma is one of the most common chronic diseases in the world and its burden of disease is exceedingly high. According to current guidelines, the asthma action plan is a cornerstone in the management and control of asthma exacerbations. Written action plans are now recommended for all children with asthma as part of initial home management of acute wheezing episodes and exacerbations. Translating the written asthma action plan to Filipino and testing it for cultural content validity and reliability will make it useful on a wider scale in our country, help reduce morbidity, and improve asthma control in the Filipino pediatric population.

**Objectives.** To perform content and cultural validation and reliability testing of the Filipino Written Asthma Action Plan (FWAAP).

**Methods.** The Written Asthma Action Plan was translated to Filipino following conventional translational steps: 1) forward translation, 2) back translation, 3) pilot testing and validation, 4) final translated version. We conducted a cross-sectional study and administered the FWAAP during pilot testing among children and caregivers with asthma attending an asthma clinic.

**Results.** We included 31 patients. The participants considered the FWAAP to be relevant to their disease, understandable, concise and useful in the management of asthma. The tool was shown to be highly consistent (Cronbach's alpha coefficient = 0.9235 showing that the. Seigel and Castellan's Kappa (Inter-rater or Inter-observer consistency) showed inter-rater agreement of 0.9615 (kappa of 0.7787) and 0.923 (kappa of 0.8846) respectively showing adequate inter-rater agreement.

**Conclusion.** The Filipino asthma action plan is a reliable and valid tool for managing asthma in the home setting.

*Keywords: written asthma action plan, validation, Filipino*

## INTRODUCTION

Asthma is a complex disorder characterized by variable and recurring symptoms, airflow obstruction, bronchial hyperresponsiveness, and an underlying inflammation.<sup>1</sup> It is one of the most common chronic diseases in the world with an exceedingly high burden of disease. According to the World Health Organization (WHO), asthma affected an estimated 262 million people and caused 461,000 deaths globally in 2019.<sup>2</sup> Furthermore, the Centers for Disease Control and Prevention in the US reported in 2019 that the prevalence of asthma in the pediatric age group (ages 18 and below) is approximately 5.1 million.<sup>3</sup> In the recent

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2021 Global Initiative for Asthma (GINA) guidelines, it is still emphasized that the asthma action plan is a cornerstone in the management and control of asthma exacerbations or 'flare-ups'. Written action plans are now recommended for all children with asthma as part of initial home management of acute wheezing episodes and exacerbations.<sup>1</sup>

The Philippines ranks 44<sup>th</sup> in the world in terms of prevalence of clinical asthma.<sup>4</sup> At the UP-PGH Allergy outpatient department alone, approximately 1,903 pediatric patients with asthma were seen during the last 5 years (2011 to 2015). A total of 226 of were newly diagnosed patients.<sup>5</sup>

Many patients with asthma lack adequate control of their symptoms that negatively affects their overall quality of life and leads to increased use of expensive emergency care services. Patient barriers to the reduction of the burden of asthma worldwide include cultural factors, lack of information, over-reliance on acute care, use of alternative unproven therapies and underuse of self-management.<sup>5</sup> Guided self-management, which includes asthma education, regular medical review, self-monitoring, and written action plan (WAP), clearly reduces asthma morbidity.

Only more recently has self-management education been proven effective in children, with improvement in lung function, feelings of self-control and reductions in emergency department admissions, school absenteeism and unscheduled doctor visits.<sup>6,7</sup> Written action plans are effective tools to facilitate self-management. In a study by Pletta et al., parents who had asthma action plans for their children reported increased parental self-efficacy compared to those who did not and reported that the asthma action plan was helpful for home-based asthma management and in decreasing missed school and work days.<sup>8</sup> While step-up therapy is not superior to daily controller medication, symptom-based are superior to peak-flow based action plans for preventing exacerbations in children with asthma.<sup>9</sup> The objective of this study is to develop a reliable and validated Filipino written asthma action plan intended for patients aged 5–18 years.

## MATERIALS AND METHODS

### Study Design, Setting, and Population

This was a cross-sectional study with four phases based on previous literature.<sup>10-13</sup> The study was done at the Allergy Clinic of the outpatient department of a tertiary care hospital and approved by the institutional research ethics board. The participants were children aged 5 to 18 years who were diagnosed with bronchial asthma (BA) or BA with allergic rhinitis (AR) and their caregivers, able to give informed consent, read and understand Filipino in both oral and written forms. Excluded in this study were children with other chronic medical conditions such as bronchopulmonary dysplasia, restrictive lung disease, cystic fibrosis, congenital heart disease and developmental delay, those unable to give informed consent, and unable to read and write.

### Translation

Permission to translate the validated American National Heart, Lung and Blood Institute's written asthma action plan was obtained prior to translation. The English version was translated to the Filipino language with the help of the office of the *Komisyon ng Wikang Filipino* (Commission on Filipino Language) and a bilingual physician. The first intermediary translated version was developed by combining inputs from the forward translators and by the expert review committee composed of the principal investigator, a public health expert (specializing in community health education, promotion and behaviors), allergologists, pulmonologists, pediatricians and nurses working in the pediatric field. Back translation of the first intermediary version to English language was then performed by a bilingual allergologist, who had not previously seen the content of the asthma action plan. The committee resolved the inadequate expressions and concepts noted in the translation and then developed the second intermediary version or the pre-final version of the Filipino asthma action plan during a focus group discussion.

### Content Validity

The pre-final translated version was administered to the sample population. The participants were asked to read and understand the translated asthma action plan and were asked to give feedback by answering a questionnaire with corresponding tabulation of their response. Each participant was asked to rate the instructions and items of the pre-final translated version using a dichotomous scale (clear or unclear). Participants who rated any of the items or options as unclear were asked to provide suggestions as to how to rewrite the statements to make the language clearer:

1. *Nahirapan ka ba intindihin ang mga tanong?* (Did you have difficulty understanding this question?)
2. *Para sa iyo, anong ibig sabihin ng katanungang ito?* (What does this question mean to you?)
3. *Mahalaga ba ang katanungang ito para sa kundisyon mo?* (Is the question relevant to your condition?)
4. *Kung ikaw ang magtatanong, anong mga kataga/salita ang gagamitin mo sa pagtatanong?* (How would you have worded this question?)
5. *Karagdagang komento* (Other comments)

### Reliability

The reliability of the Filipino written asthma action plan was evaluated using measurements for internal consistency (Cronbach's alpha coefficient) and inter-rater or inter-observer consistency (Seigel and Castellan's kappa). A Cronbach's alpha value more than 0.6 indicates good internal consistency while a kappa of 0.7 would indicate adequate inter-rater agreement.

### Final Filipino Asthma Action Plan

The final version of the Filipino Written asthma action plan was then developed based on the results of the content

GREEN ZONE: Maayos ang pakiramdam	YELLOW ZONE: Malubhang atake	RED ZONE: Emergency!
<p>Walang sintomas sa araw at gabi:</p> <p><input type="checkbox"/> Pag-ubo</p> <p><input type="checkbox"/> Paghinga na parang may huni</p> <p><input type="checkbox"/> Paninikip ng dibdib</p> <p><input type="checkbox"/> Kapos sa paghinga</p> <p>Nagagawa ang mga karaniwang ginagawa.</p> <p>Peak flow meter _____ (mahigit 80% ng iyong personal best o hinuhulaan)</p> <p><b>AKSYON:</b> Ipagpatuloy ang kasalukuyang paggamot gaya ng inirekomenda sa iyo: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Pag-iral sa kahit isa sa sumusunod:</p> <p><input type="checkbox"/> Pag-ubo</p> <p><input type="checkbox"/> Paghinga na parang may huni</p> <p><input type="checkbox"/> Paninikip ng dibdib</p> <p><input type="checkbox"/> Kapos sa paghinga</p> <p>Nagigising sa gabi dahil sa hika. Nakakagawa ng ilan ngunit hindi lahat ng gawain.</p> <p>Peak flow meter _____ hanggang _____ (60% hanggang 70% ng iyong personal best)</p> <p><b>AKSYON:</b> Langhapin ang iyong quick-relief bronchodilator _____ tuwing ika-20 minuto na maging 3 dosis hanggang sa maginhawaan. Pumunta sa ER para sa karagdagang pag-susuri at posibleng pagpapa-admit kung:</p> <ol style="list-style-type: none"> <li>Lumala ano mang oras.</li> <li>Kung hindi maginhawaan pagkatapos ng 3 dosis ng iyong quick-relief bronchodilator.</li> </ol> <p>Habang papunta sa ER ipagpatuloy ang paglanghap ng iyong quick-relief bronchodilator tuwing ika-20 na minuto at uminom ng isang dosis ng oral steroids gaya ng: _____</p> <p>_____</p> <p>Kung <b>MAGANDA</b> ang tugon sa AKSYON gaya ng nasa itaas, gawin ang sumusunod: _____</p> <p>_____</p>	<p>Pag-iral ng alinman:</p> <p><input type="checkbox"/> Nahihirapan maglakad o mag-salita</p> <p><input type="checkbox"/> Pangigitim ng mga labi at kuko sa kamay</p> <p>Hindi nakatulong ang mga quick-relief na gamot. Hindi nagagawa ang karaniwang ginagawa. Paglubha ng mga sintomas.</p> <p>Peak flow meter _____ (mababa sa 60% ng iyong personal best)</p> <p><b>AKSYON:</b> Magpunta sa ER. Langhapin kaagad ang 1 dosis ng iyong quick-relief bronchodilator tuwing ika-20 minuto habang papunta ng ER. Uminom ng 1 dosis ng oral steroid gaya ng sumusunod: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

Figure 1. Pre-final Filipino Asthma Action Plan.

validity and reliability testing and the inputs from the sample population.

## RESULTS

### Translation

The pre-final version of the Filipino asthma action plan was administered to the study participants (Figure 1).

### Study Population

We included 31 participants in the study with a mean age of 10 years (range, 5 to 18). Among the participants, 18 were females and 13 were males. Based on the GINA guidelines, majority of the participants had controlled asthma (n = 27), 3 had partly controlled asthma while only 1 participant had uncontrolled asthma (Table 1). Most of the respondents who answered the questionnaire were the guardians of the patients while four patients answered the questionnaires themselves.

### Content Validity

Majority understood that the asthma action plan is used as a guide to assess and manage asthma symptoms and exacerbations at home. All participants (n = 31) responded that all parts or items of the action plan were relevant to their

Table 1. Patient demographic characteristics

Patient Characteristics	No. of Patients (%) (N=31)
<b>Age</b>	Mean (SD): 10.19 (4.10) Range: 5-18
<b>Sex</b>	
Male	13 (42)
Female	18 (58)
<b>Asthma Control Classification</b>	
Controlled	27 (87)
Partly controlled	3 (10)
Uncontrolled	1 (3)
<b>Annual Household Income</b>	
<100,000	4 (13)
100,000 - 200,000	2 (6)
>200,000	5 (16)
No answer	20 (65)
<b>Educational Attainment of Respondent</b>	
Elementary graduate	0 (0)
High school undergraduate	2 (6)
High school graduate	13 (42)
College undergraduate	9 (21)
College graduate	7 (23)

disease or their child's disease. Majority of the participants (n = 29) responded that they had no difficulty understanding all items of the action plan, while 2 participants (6%) had to clarify all items pertaining to the peak flow meter

determination and interpretation (item numbers 1 to 9). Terms such as “*pag-iral ng*” were changed to “*pagkakaroon ng*” in items 4 and 7. Clarifications about peak flow reading and monitoring at home described in items 2, 5, and 8 were addressed by carefully explaining to the caregiver the proper use of the peak flow meter and interpretation of the peak flow values.

### Face Validity

All participants successfully read and answered the questionnaire for the asthma action plan. No major concerns regarding the Filipino asthma action plan format (fonts, colors, and size), content and usability were raised using the questionnaire and during face-to-face interviews with the participants. All respondents indicated that they find the action plan a useful tool for asthma management at home.

### Reliability

The tool was consistent and reliable (calculated Cronbach’s alpha coefficient for internal consistency = 0.9235 (Table 2). Since the action plan is not a questionnaire per se and consists of action points based on how the patients would classify their symptoms and peak flow values, we divided the action plan into two items. With item 1 providing 3 sets of symptoms (or zones) to choose from and item 2 their peak flow rates.

**Table 2.** Cronbach’s alpha coefficients

Items	Cronbach’s Alpha	Std. Alpha
All Items	0.9235	0.9286
Item 1	0.8667	0.8667
Item 2	0.7512	0.8667

Seigel and Castellan’s Kappa (inter-rater or inter-observer consistency) was calculated using fixed marginal kappa. Inter-rater agreement for item 1 was 0.9615 with a kappa of 0.7787. Inter-rater agreement for item 2 was 0.923 with a kappa of 0.8846. Both kappa values indicates adequate inter-rater agreement for each item (Table 3).

**Table 3.** Fixed Marginal Kappa (Seigel and Castellan’s Kappa)

Items	% Overall Agreement	Fixed Marginal Kappa
Item 1	0.9615 (96.15%)	0.7787
Item 2	0.923 (92.3%)	0.8846

### Final Filipino Asthma Action Plan

The final Filipino asthma action plan for patients 5 to 18 years old was developed based on content validity and reliability testing (Figure 2).

## DISCUSSION

A Filipino version of the asthma action plan was developed from the original English version. During development of the pre-final version of the action it was agreed upon by the expert review group that the study population found the Filipino asthma action plan relevant to their disease, understandable, concise and useful for management of their asthma. Clarifications about peak flow reading and monitoring at home described in items 3, 5, and 11 were addressed by carefully explaining to the caregiver the proper use of the peak flow meter and interpretation of the peak flow values. In addition to the translation done, the investigator recommends that a manual or handout on how to use the peak flow meter at home be given to the patient as well. Based on the study done by Gibson et al., individualized action plans can be based upon the predicted PEF or the personal best PEF for that individual.<sup>14</sup> Action points based on personal best PEF consistently improved health outcomes whereas those based on percentage predicted PEF did not. With personal best PEF as the basis of the action plan, there were reductions in hospital admissions, emergency room visits, and improvement in PEF.<sup>14</sup> Furthermore, the investigator noted that most of the pilot study respondents preferred and had better understanding of exact numerical values rather than percentage values for PEF.

The pre-final version of the Filipino asthma action plan for children had good internal consistency (Cronbach’s alpha coefficient = 0.9235) and fixed marginal kappa of 0.7787 and 0.8846 indicating adequate inter-rater consistency. Thus, we conclude that the questionnaire is reliable.

## CONCLUSION

The Filipino asthma action plan was found to be a reliable and valid tool for asthma self-management at home.

We recommend that a prospective longitudinal study be done with pre-treatment and post-treatment tests, larger sample size, and comparison of patient rating and physician rating of severity and control of symptoms. This will assess test-retest reliability, convergent validity, discriminant validity, clinical reliability and effectiveness of the Filipino asthma action plan in the management of asthma symptoms and exacerbations in children in the home setting.

### Statement of Authorship

All authors contributed in the conceptualization of work, acquisition and analysis of data, drafting and revising and approved the final version submitted.

### Author Disclosure

All authors declared no conflicts of interest.

### Funding Source

The study has no funding support.

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<p>Walang sintomas sa araw at gabi:</p> <p><input type="checkbox"/> Pag-ubo</p> <p><input type="checkbox"/> Paghinga na parang may huni</p> <p><input type="checkbox"/> Paninikip ng dibdib</p> <p><input type="checkbox"/> Kapos sa paghinga</p> <p>Nagagawa ang mga karaniwang ginagawa.</p> <p>Peak flow meter _____ (mahigit 80% ng iyong personal best o hinuhulaan)</p> <p><b>AKSYON:</b> Ipagpatuloy ang kasalukuyang paggamot gaya ng inirekomenda sa iyo: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Pagkakaroon ng kahit isa sa mga sumusunod:</p> <p><input type="checkbox"/> Pag-ubo</p> <p><input type="checkbox"/> Paghinga na parang may huni</p> <p><input type="checkbox"/> Paninikip ng dibdib</p> <p><input type="checkbox"/> Kapos sa paghinga</p> <p>Nagigising sa gabi dahil sa hika. Nakakagawa ng ilan ngunit hindi lahat ng gawain.</p> <p>Peak flow meter _____ hanggang _____ (60% hanggang 80% ng iyong personal best)</p> <p><b>AKSYON:</b> Mag-puff o magpausok ng iyong quick-relief bronchodilator _____. Maaaring gawin ito ng 3 beses na may pagitan na 20 minuto bawat dose hanggang sa maginhawaan. Pumunta sa ER para sa karagdagang pagsusuri at posibleng pagpapa-admit kung:</p> <ol style="list-style-type: none"> <li>1. Lumala ano mang oras ang sintomas.</li> <li>2. Kung hindi maginhawaan matapos ang 3 dose ng pagpuff o pagpausok ng iyong quick-relief bronchodilator.</li> </ol> <p>Habang papunta sa ER ipagpatuloy ang pagpuff o pausok ng iyong quick-relief bronchodilator kada 20 minuto at uminom ng isang dose ng oral steroids: _____</p> <p>Kung GUMINHAWA ang pakiramdam pagkatapos gawin ang mga aksyon sa itaas, gawin ang mga sumusunod: _____</p> <p>_____</p>	<p>Pagkakaroon ng alinman:</p> <p><input type="checkbox"/> Nahihirapan maglakad o mag-salita</p> <p><input type="checkbox"/> Pangigitim ng mga labi at kuko sa kamay</p> <p>Hindi nakatulong ang mga quick-relief na gamot. Hindi nagagawa ang karaniwang ginagawa. Paglubha ng mga sintomas.</p> <p>Peak flow meter _____ (mababa sa 60% ng iyong personal best)</p> <p><b>AKSYON:</b> Magpunta sa ER. Mag-puff o magpausok kaagad ng 1 dose ng iyong quick-relief bronchodilator at ulitin ito kada 20 minuto habang papunta ng ER. Uminom ng 1 dosis ng oral steroid: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<b>PAG-IWAS SA MGA SANHI</b>	<b>INSTRUKSIYON SA ER</b>	<b>ASTHMA ACTION PLAN</b>
<p>Hanggat sa maari, lumayo sa mga bagay na nagiging sanhi ng iyong hika.</p> <p>Mga sanhi: Ehersisyo Stress Impeksyon sa daanan ng hangin at pulmon Matatapatang na amoy Pagbabago sa temperatura ng paligid Paninigarilyo o usok ng sigarilyo Mga allergen katulad ng: _____ Ibapa: _____</p> <p>3 paraan upang makontrol ang iyong hika:</p> <ol style="list-style-type: none"> <li>1. Sundin araw-araw ang iyong GREEN zone plan upang mapigilang magsimula ang mga sintomas ng hika.</li> <li>2. Kilalanin ang iyong mga sintomas ng atake ng hika. Sundin ang YELLOW zone plan upang mapigilang lumala ang atake ng hika.</li> <li>3. Sa oras ng EMERGENCY, sundin ang RED zone plan.</li> </ol> <p>REGULAR na magpatingin si iyong doctor. Kinakailangang i-update ang action plan na ito sa mga pagbabago sa iyong kondisyon/kondisyon ng pasyente.</p>	<p>DOKTOR: _____</p> <p>TELEPONO: _____</p> <p>OSPITAL: _____</p> <p>ADDRESS: _____</p> <p><i>Ang Action Plan na ito ay hango mula sa NHLBI, National Asthma Education and Prevention Program, Expert Panel Report 3: Guidelines for the diagnosis and management of Asthma, Full report 2007.</i></p>	<p>PANGALAN: _____</p> <p>MAGULANG: _____</p> <p>TAGAPANGALAGA: _____</p> <p>Address: _____</p> <p>Telepono sa bahay: _____</p> <p>Telepono sa trabaho (magulang/tagapangalaga): _____</p> <p>Pagmonitor sa Peak Flow (sukat ng hanging pwersang pinalabas sa baga): Personal Best Peak Flow: _____ Oras ng pagmomonitor: _____ Petsa ng pagsukat ng Personal Best Peak Flow: _____</p> <p>Makakatulong ang planong ito sa iyo na makontrol ng iyong hika at malaman kung ano ang gagawin kapag sinumpong ng hika.</p> <p>Ang pagkontrol sa iyong hika ay makakatulong sa iyo na:</p> <ol style="list-style-type: none"> <li>1. Makasama sa normal na gawain gaya ng pagiging aktibo sa isports at ehersisyo</li> <li>2. Magtuloy-tuloy ang tulog sa gabi na hindang sinusumpong ng hika</li> <li>3. Mapigilan ang mga pag-atake ng hika</li> <li>4. Magkaroon ng pinakamagandang bilang ng peak flow</li> <li>5. Maiwasan ang mga side effect ng gamot</li> </ol>

Figure 2. Validated Filipino Asthma Action Plan.

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