

Assessment of videos about the inhalation technique for childhood asthma: educational or mediatic?

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ABSTRACT

Videos related to asthma inhaling technique are popular on YouTube, but their quality is concerning. In this study, we aimed to assess videos demonstrating the inhaling technique of the pressurized metered dose inhaler, attached to the spacer, for children and adolescents with asthma, according to the guidelines of the Global Initiative for Asthma. We conducted an exploratory study, on 11 July 2017 using the terms “inalador pressurizado” and “aerossol dosimetrado”. Three independent nurses experienced in the field assessed the videos regarding content inclusion, production, and users. Within the 492 videos found, six met the eligibility criteria. The highlight point was the incorrect demonstration of the inhalation technique in all videos and the inadequate scoring for technique and content assessments. Our study findings show that videos are not reliable neither compatible with asthma guidelines and, therefore, they should not be recommended for educational purposes.

Descriptors: Asthma; Metered Dose Inhalers; Administration, Inhalation; Pediatric Nursing.

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Received: 08/17/2017.

Accepted: 02/28/2018.

Published: 07/04/2018.

Suggest citation:

Fernandes ICF, Siqueira KM, Barbosa MA. Assessment of videos about the inhalation technique for childhood asthma: educational or mediatic? Rev. Eletr. Enf. [Internet]. 2018 [cited _____];20:v20a09. Available from: <http://doi.org/10.5216/ree.v20.48789>.

INTRODUCTION

Asthma, one of the most common chronic disease in the world, is characterized by the inflammation of the airways and lead to recurrent episodes of wheezes, dyspnoea, thoracic oppression, and cough, especially at night or early in the morning⁽¹⁻²⁾. The inhaled medications, attached to the spacer, are frequently prescribed to help to control the symptoms and to reduce the risk of exacerbations or crises. However, evidence suggests that many people with asthma do not use the inhaler correctly⁽³⁻⁴⁾.

In the childhood population, the incorrect manipulation of the inhaler attached to the spacer is the leading cause of insuccess in asthma control, and it associates with more visits to emergency services⁽⁵⁻⁶⁾. Thus, the international guidelines, notably the Global Initiative for Asthma (GINA), recommends the technical abilities of the inhaler to be demonstrated in each appointment^(1-2,7).

Considering time limitations of an appointment and the many aspects to be addressed – symptoms, number of crises, environmental control – health professionals do not regularly assess the inhalation technique. Therefore, children and adolescents, as well as, their caregivers, rely on innovative strategies, as videos, to learn the correct inhalation technique⁽⁸⁻⁹⁾.

The importance of videos in social networks in the health context is increasingly recognized⁽¹⁰⁻¹¹⁾. The social media and video sharing sites, like YouTube, became part of daily life and the number of health-related videos increases daily⁽¹²⁻¹³⁾.

There is a high chance that patients search for audiovisual information about health procedures and techniques. Besides, health professionals search for supplementation of the verbal and written information for the patient, with audiovisual information⁽¹⁰⁻¹³⁾.

Despite videos related to asthma inhalation technique not being very popular on YouTube, quality is always a concerning issue⁽¹⁴⁾. Because it is a public domain platform, any person can create and publish a video, without going through rigorous criteria of content assessment.

Therefore, considering the need of a systematic analysis of communications related to inhaling technique for children and adolescents with asthma, it is essential to deepen the knowledge in this field so that we can provide educational health content for this population, as well as, for health professionals involved with care.

Thus, our study aimed to assess the videos demonstrating the inhaling technique of the metered dose inhaler, attached to the spacer, for children and adolescents with asthma, and its agreement with the GINA guidelines.

METHODS

We conducted an exploratory study with a quantitative approach, in a video-sharing site YouTube, virtual address <http://www.youtube.com/>. Nowadays, this is the site with higher representativity among Internet users for sharing, advertisement and watching videos⁽¹⁵⁾.

For the search, the following steps composed the study: research theme; guiding questions; objective; research strategy; videos selection; critical assessment of videos; presentation of results.

The guiding questions were “What has been addressed about the inhaling technique of the Pressurized Metered Dose Inhalers (PMDI), attached to the spacer, for asthmatic children and adolescents, in YouTube videos?” and “Are the inhaling techniques in accordance with the GINA guidelines?”

The search was conducted on 11 July 2017, using the search field in YouTube. The search strategy was based on the following terms: “*inalador pressurizado*” and “*aerossol dosimetrado*”. The choice was based on the most used language about the inhaling medication formatted as metered dose pressurized inhaler. The chosen language was Portuguese, once the site offers only one option to change the visualization language of the page, not the content added by users.

We applied filters offered by the site: “type”- video and “duration” – short (less than four minutes). As the site offers other types of media, like channel, playlist, movies, and shows, we opted to select only the videos. The choice of short duration videos is justified by being the most accessed by YouTube users⁽¹⁵⁾ and, therefore, those with higher potential to be seen. We also included videos that addressed the technique for the PMDI, attached to a spacer, for children and adolescents with asthma. We did not restrict videos according to the time of publication. We excluded videos addressing the technique of the PMDI attached to the spacer and mask.

We saved the links from the initial search to allow as many visits as necessary, to not compromise the sample selection. We did this because there is a continuous addition of new content on the site.

We identified 492 potentially eligible videos to include in this study. After the triage and eligibility process, six videos were included for quantitative synthesis, as detailed in Figure 1.

We collected the data using an instrument addressing the following items: responsible for the publication (person, company or health organization), upload date and a total number of visualizations. To assess the videos, we used a modification of the criteria described in the Evaluation of Video Media Guidelines⁽¹⁶⁾, as seen in Chart 1.

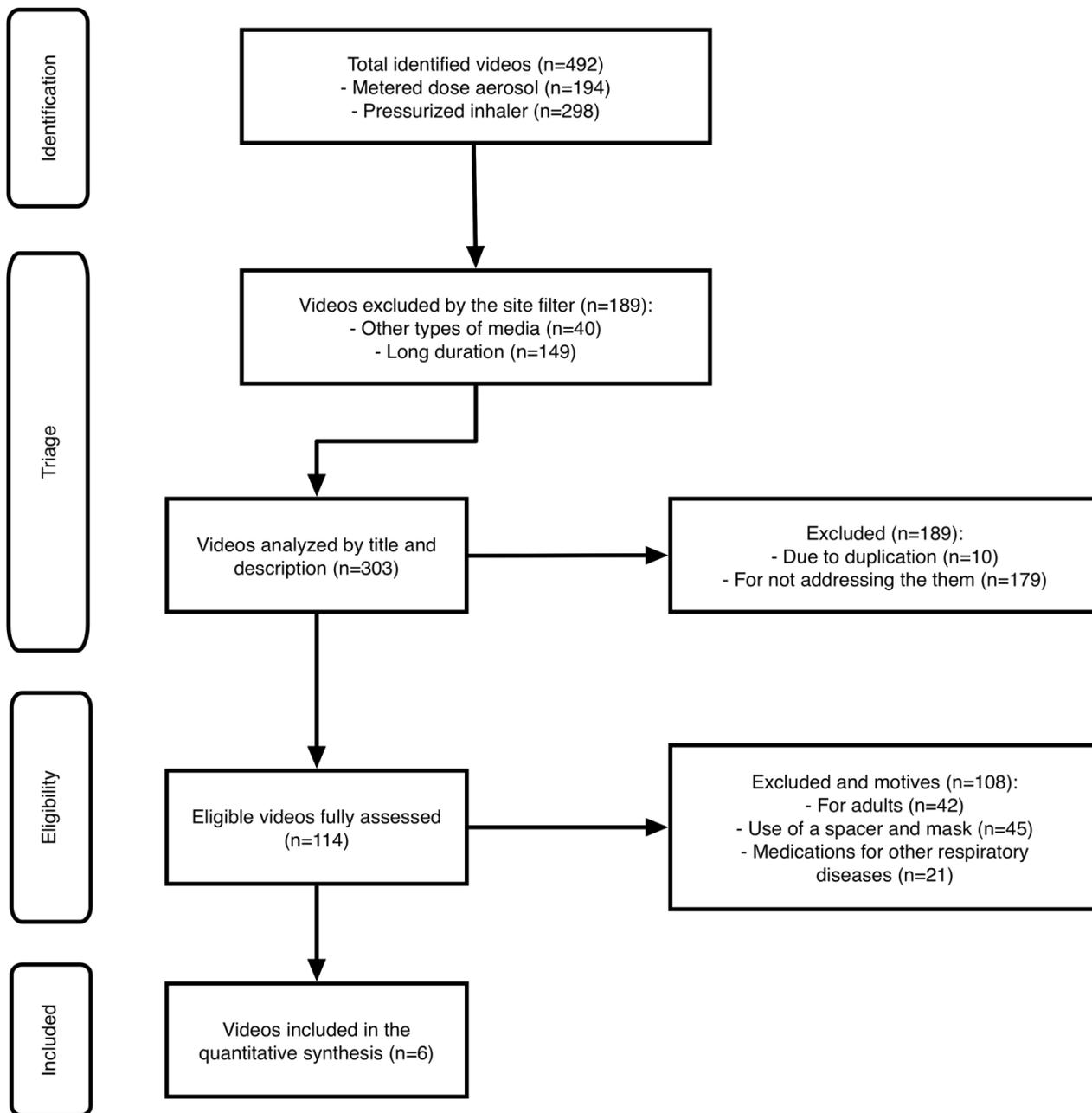
This instrument is originally composed by four categories (content, production, users, and presentation free of bias) and, for this study, we opted only for the first three ones, as this is authorized conduct by Feller and it was used in another health study⁽¹³⁾.

Each variable was assessed with a Likert-type scale from 0-5, being 0 (does not apply), 1 (very unsatisfying), 2 (unsatisfying), 3 (regular), 4 (satisfying) and 5 (very satisfying)⁽¹³⁾. Thus, each video could reach a maximum score of 65, and we categorized as 0-12 (very unsatisfying), 13-25 (unsatisfying), 26-39 (regular), 40-53 (satisfying) and 54-65 (very satisfying)⁽¹³⁾. Notably, there was a reduction in the general score classified initially by Feller, once we opted to remove one video assessment category.

To verify the content conformity presented in videos with the GINA guidelines, we verified what the points were related to the inhaling technique of the metered dose inhaler, attached to the spacer. Therefore, we adopted the recommendation of the following sequence of the inhaling technique⁽¹⁾: 1. To remove the inhaler top; 2. To remove the spacer top; 3. To position the inhaler vertically with the mouthpiece down and to keep in this position during the whole use; 4. To shake the inhaler before using it; 5. To fit the inhaler in the spacer; 6. To bring the chin up a little bit or to keep the head straight; 7. To expire, emptying all air from the lungs; 8. To put the mouthpiece between the teeth, without biting it and to close the lips firmly; 9. To press the container only once; 10. And, immediately, to start a slow and deep inhalation, expanding the thorax; 11. The inhalation should last until filling

the lungs with air; 12. To take off the spacer from the mouth with the lips closed and holding the breath and to keep the thorax inflated; 13. To hold the breath counting up to 10 seconds; 14. To release the air; 15. If another jet is prescribed, to wait 30 to 60 seconds and repeat the steps 3 to 12; 16. To clean the mouth by washing it or brushing the teeth.

Figure 1: Flow-chart of the selection process of videos.



Three nurses experienced in this field loaded and assessed all videos independently. We analyzed the data using simple descriptive statistics, according to absolute and relative frequency. Our research used public domain material, and it is not directly involved with human beings. Therefore, there was no need for an Ethics Committee approval.

Chart 1: Assessment script of videos selected for the study, according to content, production, and users.*

Content
- Presentation at the beginning of the video about its intention (in the first moments of the video);
- Title integrity (the title correctly reflects the video objective);
- The absence of external material than the one cited in the video;
- Use of correct technique (the abilities should demonstrate the ideal pattern);
- Allows the development of abilities (the video provides information that enables the person to improve or develop abilities);
- Health and safety (the content is adequate regarding guaranteeing the patient's and professional's safety);
Production
- Image quality (focus, brightness, color accuracy and balance);
- Sound quality (clearness, volume and speech speed);
- Extension (the video should have a compatible duration with the quantity of information presented).
Users
- Objective and audience (general and specific objectives should be clear);
- Synopsis (it should have a clear summary giving accurate descriptions of the video);
- Effectiveness assessment (an existing way to effectively assess the offered material);
- Discussion/activities/resources (specific suggestions are offered to encourage users to change from a passive to an active involvement).

* Adapted from the instrument proposed by Feller (1992)⁽¹³⁾.

RESULTS

Videos posted by people in the category “science and technology” were predominant, with a temporal dimension of 2010 to 2017. The analyzed videos were seen 80,491 times, with an average of 13,415 visualizations per video.

The findings showed that all videos concentrated in the inadequate description of inhaling technique. When they bring references, the step by step presented does not reflect the cited content. Even in videos posted by health professionals⁽²⁰⁻²¹⁾, this fragility is present. Besides, we did not find playful videos or with language directly appropriate for a child.

Regarding the general assessment, there was no disagreement within the assessors, once this video categorization has a broad variety of points that allowed standardization within the same category. Therefore, after an analytical assessment, we systematized the data (Chart 2).

Regarding the video assessment according to the inhaling technique recommended by GINA, we observed an incorrect demonstration in all videos. Few steps were not even detailed in the presentation, according to Table 1.

Within the main mistakes found in the description of the inhaling technique, the following recommendations were noted: to inhale the medication and breath normally one to five times; and, to inhale the medication and take a deep breath.

Chart 2: Description of the videos selected for the study, according to the responsible for posting, year, language, category, visualizations, video assessment criteria and general video assessment.

Responsible for posting/year, category and visualizations	Considerations about the video assessment criteria (content, production, and users)	Video general assessment
Person / 2010 ⁽¹⁷⁾ / Portuguese (Brazil)	- Content: the steps of the inhaling technique are correct, but important steps recommended by GINA were omitted.	Satisfactory
Science and technology	- Production: bad image quality.	
64,794	- Users: does not offer a synopsis with a clear summary of what will be addressed; does not offer specific suggestions to encourage users to change from passive to active involvement.	
Person / 2010 ⁽¹⁸⁾ / Portuguese (Brazil)	- Content: presents a step not recommended by GINA (to press the "little pump" and breathe 5 to 10 times).	Regular
Science and technology	- Production: short video duration and non-compatible with the number of information that should be presented; bad image quality; especially when using focus.	
12,393	- Users: does not offer a synopsis with a clear summary of what will be addressed; does not offer specific suggestions to encourage users to change from passive to active involvement.	
Medical school / 2011 ⁽¹⁹⁾ / Portuguese (Portugal)	- Content: there is no presentation of the video intention at the beginning; presents a step not recommended by GINA (after inhalation, to breath normally 3 to 5 times); omits important steps that does not guarantee the efficacy of the used medication.	Very unsatisfactory
Science and technology	- Production: insufficient duration of the information presented.	
1,281	- Users: does not offer a clear summary of what will be addressed in the video; the video objectives are not clear; does not offer specific suggestions to encourage the user to change from passive to active involvement.	
Person (health field) / 2016 ⁽²⁰⁾ / Portuguese (Brazil)	- Content: there is no presentation of the video intention in the first moments; the title does not correctly reflect the video objective; despite bringing the references, the inhaling technique presented does not demonstrate the standard suggested by GINA.	Regular
People and blogs 63	- Users: does not offer specific suggestions to encourage the user to change from passive to active involvement.	
Person (health field) / 2016 ⁽²¹⁾ / Portuguese (Brazil)	- Content: Inappropriate title for the video objective; does not address the correct sequence recommended by GINA, compromising the efficacy of the inhaled medication.	Very unsatisfactory
Education	- Production: bad image quality, with compromised focus, brightness, and colors; video duration inappropriate for the quantity of presented information.	
1,75	- Users: the synopsis does not offer a clear summary of what will be addressed in the video; it does not offer specific suggestions to encourage the user to change from passive to active involvement.	
Company (health field) / 2017 ⁽²²⁾ / Portuguese (Portugal)	- Content: It omits important steps of the inhaling technique that does not guarantee the efficacy of the recommended medication.	Regular
Science and technology	- Users: the synopsis does not offer any information that can relate to what will be addressed in the video; it does not offer specific suggestions to encourage the user to change from passive to active involvement.	
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Table 1: Frequency of selected videos according to the inhaling technique sequence recommended by GINA⁽¹⁾.
Goiânia, GO, Brazil, 2017.

Inhaling technique steps	N	%
1. To remove the inhaler top;	3	50
2. To remove the spacer top;	0	-
3. To position the inhaler vertically with the mouthpiece down and to keep in this position during the whole use;	5	83
4. To shake the inhaler before using it;	6	100
5. To fit the inhaler in the spacer;	6	100
6. To bring the chin up a little bit or to keep the head straight;	0	-
7. To expire, emptying all air from the lungs;	4	67
8. To put the mouthpiece between the teeth, without biting it and to close the lips firmly;	2	33
9. To press the container only once;	0	-
10. And, immediately, to start a slow and deep inhalation, expanding the thorax;	0	-
11. The inhalation should last until filling the lungs with air;	0	-
12. To take off the spacer from the mouth with the lips closed and holding the breath and to keep the thorax inflated;	1	17
13. To hold the breath counting up to 10 seconds;	3	50
14. To release the air;	2	33
15. If another jet is prescribed, to wait 30 to 60 seconds and repeat the steps 3 to 12;	0	-
16. To clean the mouth by washing it or brushing the teeth.	1	17

DISCUSSION

The videos related to the inhaling technique of the PMDI, attached to a spacer, for children and adolescents with asthma, did not have adequate scoring in the assessment and they were not considered as good quality for educational purposes.

A point that should be highlighted in all videos was the incorrect demonstration of the inhaling technique, even in those indicated by health professionals. Only one material cited GINA as a reference, but it demonstrated the poor technique. It reflects the lack of ethical compromise of health professionals when recommending an ineffective technique without scientific evidence to prove the given information.

Another aspect corroborating with the production of these videos is the facility to publish in platforms, once there is no rigorous assessment of the material quality. To provide additional educational health content can be an approach to improve the quality of these videos⁽²³⁾. It is viable to use a recommendation system based on semantic content that links users to respectable educational sites, as MedlinePlus, for a particular health video from Youtube⁽²⁴⁾.

While the system is not implemented, it is ideal for the population and health professionals to use the guidelines and guides for audiovisual media production. It can facilitate and be an essential part of the process, once this is a reference document and an information source to guide users to select and use videos effectively⁽²⁵⁻²⁶⁾.

Regarding the inhaling technique, to follow the steps correctly guarantee the drug efficacy and, consequently, promoter a better asthma control^(1-2,4,7). The expiration of the whole air in the lungs is a crucial step, once it guarantees the adequate residual volume in the inspiration of the medication. In children, this step should

be cautiously observed, as they usually present difficulty in expiring the air from the lungs, therefore compromising the inspired medication. Thus, it is important to observe each child, asking them to do the total expiration of the lungs and that to inspire the medication in about two to three seconds^(1,5,27).

The indication to normally breathe with the spacer in the mouth should be only for the bi-valve ones, a mechanism that impedes the air return to the spacer's body and the medication dilution. This indication is given for the breathing before the medication use, as well as, between the prescribed doses. As the craft spacer does not have this mechanism, it is not recommended to breath with it attached to the mouth⁽²⁸⁻²⁹⁾. Therefore, considering the high use of this type of spacer, it becomes mandatory to guide breathing without the device connected to the mouth.

The apnea after inspiring the medication is also a crucial step. To wait 10 seconds in apnea guarantees the correct deposit of the drug in the lower airways and, consequently, will promote the medication efficacy^(1-4,7). In the childhood population, attention should be given so there is no medication scape by the mouth or nasal expiration^(1,4). Another point is to incentivize counting the time in thoughts or using the fingers.

Considering the video assessment, we observed that they were productions without a scientific background, considering the content and the audiovisual technique part. Although it is currently easy to produce a video, some technical aspects should be considered, once the producers should not only designate materials to reach particular goals and, yes, to assume the responsibility of presenting information about the effective use of such materials.

Videos are recommended to report their objectives, concepts, and information, paying attention to the public impact. The video objective should be evident to the spectator at the beginning of the presentation, to prepare the public for the learning tasks involved and to increase the video efficacy as a motivational and learning tool^(15-26,30).

The video should motivate the public to have some adequate behavioral response. The content and how the video is presented should help the transition from passive visualization to the discussion, accompaniment activities or other answers to provide the active involvement, essential for ideal learning^(25,30).

CONCLUSION

Our findings highlight that most videos about the inhaling technique of the PMDI, attached to a spacer, for children and adolescents with asthma is not adequate for educational purposes.

The mediatic communication, nowadays incorporated in the population's vocabulary as a reference to resolve everyday health-related issues, directly affects the adequate health care, compromising proper management of childhood asthma.

Health professionals should be conscient and to adopt this evolving technology to increase the awareness about the importance to conduct the correct PMDI, attached to a spacer, mainly due to the importance of asthma control. In this context, we believe that our study can show the importance in the directing of the pediatric nursing work.

We suggest the creation of videos according to currently available guidelines, and that consider the appropriate explanation in details of the inhaling technique, clearly demonstrating each step. Besides, to be an attractive and playful material, once it is destined to children and adolescents.

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