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Original Research

Study on knowledge of MDI (metered dose inhaler) vs nebulizer in parents of asthmatic children of age group 2 to 8 years

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Abstract:
Childhood asthma is a major public health issue. This paper describes the correct techniques of administering MDIs with spacers and nebulizers in children to control asthma. The study was a descriptivecross sectionalstudy designed to evaluate the parental knowledge. The information was obtained by interviews conducted with the parents/guardians using standardised questionnaires on knowledge, choice and effect of education on adherence to asthma control. The results of the study suggest that there are gaps in knowledge regarding MDIs with spacers in asthma management, and education to correct misconceptions about the treatment and correct technique of use of device should be provided.

Keywords: Asthma, Pediatrics, MDI, Nebulizer, Parental Knowledge, Inhalation Devices, Adherence, Perception, Asthma Management, Education

Introduction:

Asthma is a constant respiratory condition and a significant general wellbeing concern, especially in youngsters. Effective management of asthma in pediatric patients through inhalation therapy is fundamental. Among the different medicines accessible, the right utilization of inhalation devices, like Metered Dose Inhalers(MDIs)with spacer and nebulizers, is vital for guaranteeing the compelling conveyance of prescription and the management of asthma. MDIs are smaller, versatile devices that convey an exact portion of medicine to the lungs, while nebulizers convert fluid prescription into a fog that is breathed in through a cover or mouthpiece. The two devices are generally utilized in the treatment of asthma in children, however each enjoys extraordinary benefits and difficulties.

Parental knowledge and perception of these devices play significant part in the adherence to endorsed treatment regimens. Caretakers frequently have various perspectives on the viability, convenience, and possible results of MDIs and nebulizers, which might impact their decision of use of that device. Understanding these perceptions is basic in light of the fact that parental inclinations can straightforwardly influence a youngster's asthma management plan and general wellbeing. Besides, the degree to which guardians are instructed by medical care provider about the correct use of MDIs and nebulizers can likewise influence their adherence to asthma management. Deficient education might prompt ill-advised utilization of the devices, decreased viability of treatment, and expanded paces of asthma intensifications.

This study intends to evaluate the knowledge and perception of parents of asthmatic youngsters in regards to the utilization of MDI with spacer versus nebulizers at JNU Medical college(JNUIMSRC), Jaipur. Investigators aiming tostudy, how parental figuring out, inclinations, and the degree of education given by medical care experts impact the decision of inhalation devices and adherence to asthma therapy plans. By looking at these variables, the review tries to give experiences that can be utilized to work on educating and backing guardians in pursuing informed choices with respect to asthma management for their kids.

Aim:

To compare the knowledge, perception, and preferences of parents regarding the use of MDIs with

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spacers versus nebulizers for managing asthma in children of age groups 2-8 years.

Literature Review

The utilization of inhalation devices like Metered Dose Inhalers (MDIs) with spacers and nebulizers is basic in the management of pediatric asthma. A few studies have zeroed in on the knowledge, perception, and adherence to asthma treatment plans among guardians of asthmatic youngsters. This segment analyses pertinent writing on the studies among MDIs and nebulizers, the effect of parental knowledge and education, and the variables impacting device inclination and adherence.

Comparison of MDIs with spacers and Nebulizers in Asthma Management

The similar viability of MDIs and nebulizers in treating asthma has been a critical focal point of a few studies. Batra et al. (1997) led a near report on the viability of stream nebulizers and MDIs with a spacer in the treatment of intense asthma. They observed that the two devices were similarly compelling in conveying medicine, however MDIs with a spacer were more straightforward to use in pediatric patients. Additionally, Benito-Fernandez et al. (2004) assessed the utilization of salbutamol through MDI with a spacer versus nebulization for intense pediatric asthma therapy in the crisis division, presuming that the two strategies were successful, yet MDIs offered more noteworthy comfort for long haul management. Delgado et al. (2003) likewise contrasted the utilization of MDIs and spacers and nebulizers in kids aged 2 to 8 years and found that both were similarly viable for treating wheezing episodes in little youngsters. Be that as it may, nebulizers have frequently been inclined toward during intense manifestations because of the perception of improved adequacy. In a concentrate by Nambiar et al. (2020), it was found that guardians frequently favored nebulizers for intense asthma assaults, accepting that nebulizers gave more exhaustive therapy. The study likewise featured that MDIs, while versatile and helpful, were frequently seen as less successful by guardians. Vilarinho et al. (2003) upheld this finding, noticing that guardians and parental figures would in general depend more on nebulizers for moderate wheezing attacks,notwithstanding proof appearance that MDIs with natively constructed spacers could be similarly successful in these circumstances.

Parental Knowledge and Perception of Asthma Management Devices

Parental knowledge and perception of inhalation devices are significant in deciding the progress of asthma management in kids. Zaraket et al. (2011) led a cross-sectional study on parental perceptions and convictions about youth asthma, finding that a huge level of guardians needed sufficient knowledge of correct device use, especially with MDIs. The review accentuated the significance of instructing guardians on the right utilization of inhalers to further better treatment results. Conn et al. (2007) investigated the connection between parental convictions about prescriptions and adherence to asthma management. The investigation discovered that guardians with additional knowledge about the advantages and correct use of MDIs were bound to stick to endorsed treatment plans. Essentially, Aliyu et al. (2018) studied on guardians' perceptions of asthma management devices in a medical clinic setting and found that parental figures who got formal education about MDIs revealed higher fulfillment and more prominent convenience. The review highlighted the job of medical services experts in teaching guardians and parental figures on the upsides of utilizing MDIs. Peterson-Sweeney et al. (2003) additionally featured the importance of parental education, taking note of that many guardians had not gotten sufficient instructions on the best way to utilize MDIs successfully. The investigation discovered that guardians who were given point by point guidelines on device use were more certain about dealing with their kid's asthma. This lines up with discoveries from Abu-Shaheen et al. (2016), who noticed that guardians frequently see nebulizers as more compelling because of an absence of comprehension of the correct utilization of MDIs, prompting lower adherence to MDI-based treatment plans.

Factors Influencing Device Preference and Adherence

A few variables impact parental inclinations for MDIs versus nebulizers and their adherence to asthma management plans. McQuaid et al. (2009) inspected hindrances to drug use among guardians of Latino kids with asthma, finding that social convictions and misinterpretations about inhaler utilize added to an inclination for nebulizers. The review recommended that tending to these convictions through designated education could further develop adherence to MDI-based treatments. Conn et al. (2005) found that parental education level altogether affected their inclinations for inhalation devices. Guardians with advanced education levels were bound to favor MDIs because of their comfort and usability. The review stressed the requirement for customized educational mediations that think about the financial and educational foundation of guardians. Cost is another significant element impacting device inclination. Leversha et al. (2000) directed an expense viability examination contrasting MDIs with spacers and nebulizers in small kids with moderate to severe asthma. They observed that MDIs with spacers were more financially savvy and simpler to utilize, especially for long term management. Notwithstanding, many guardians actually favored nebulizers because of the perception that they were more effective duringacute attacks. Jamalvi et al. (2006) investigated the job of medical services

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supplier proposals in molding parental inclinations. The investigation discovered that guardians who got clear guidelines and proposals from medical care giver about MDI use were bound to pick MDIs over nebulizers for long term management. This features the basic job of medical services experts in impacting device decision through proper education and direction.

Methodology:

Study Design:

This is a cross sectional, observational study of one year duration(conducted at JNUIMSRC from April2023 to March2024 with the objective to establish the knowledge and perception of parents on the use of Metered Dose Inhalers (MDIs) with spacers compared to nebulizers in the management of asthma in children of 2 to 8 years of age.

Study Population:

The study population for research included the parents of asthmatic children of age two to eight (2—8) years visiting OPD. Inclusion criteria are parents of children with asthma who have experience in using MDIs with spacers or nebulizers in theirkid'streatment. The parents must give consent and be an active part of the study. Patients whose asthmatic children are not on MDIs with spacers or nebulizers, and those who did not give consent, or those who only partly filled the questionnaire were excluded.

Inclusion Criteria:

- Parents of children aged 2-8 years diagnosed with asthma.
- Parents who have used or are using **MDIs with spacers** or **nebulizers** for their child's treatment.
- Parents willing to give informed consent and participate in the study.

Exclusion Criteria:

- Children diagnosed with asthma but not currently using either **MDIs with spacers** or nebulizers.
- Parents who do not provide consent to participate.
- Parents with incomplete responses in the questionnaire.

Sample Size and Data Collection:

Convenience sampling was used to select 250 parents to participate in the study, from the outpatient clinic. The research instrument used in the study was a structured questionnaire which was completed by the respondents. The questionnaire included general information about the child including age and gender, parents' education level, household income and region (urban or rural). It also contained more specific questions designed to assess the parents' knowledge and practises regarding asthma, particularly with regard to MDIs with spacers and nebulizers.

Knowledge and Perception Assessment:

The questions adopted for the study were related to the parent's perception of MDIs with spacer and nebulizers in terms of effectiveness, ease of use,& side effects.It also assessed the extent of information that parents got about these products, including the instruction and educationgiven by the healthcare givers. This part of the study will seek to ascertain how much knowledge parents have regarding the right use of MDIs with spacers and nebulizers.

Study Procedure:

The data collection was done at the pediatric outpatients door area.After the informed consent Participants were then given questionnaire to fill in.They were allowed to seek help. The research team made sure that the answers were documented well and the questionnaires were collected at the end of the study. This way of data collection helped in maintaining the standardisation of the data collected by the research team.

Data Analysis:

All the collected data in the questionnaires were analysed and entered into Statistical Package for Social Sciences (SPSS) software version 25. Results were analysed using chi-square tests to determine the associations between parental knowledge and perceptions and demographic variables including education level, income, and place of residence. Likewise, logistic regression analysis was used to determine the predictors of parents' choice between MDIs with spacers or nebulizers. This analysis allowed the identification of certain factors that influence the decision making of the choice of inhalation devices.

Results:

4.1: Demographics

Table 1: Who filled out this questionnaire?

Parent	Frequency (n=250)	Percentage (%)
Mother	180	72%
Father	70	28%

Slightly over two-thirds of the questionnaires were completed by mothers while one third was completed by fathers. This major variation suggests the fact that, in most instances, mothers are more likely to be more engaged in the process of managing their children's asthma regime or in answering to certain health questionnaires. This might have been due to the fact that women especially mothers are more involved in

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the management of health issues. The high representation of mothers may also bias the results because the knowledge, attitudes, and choices of mothers may not be the same as those of fathers. This is because it is important for a parent education programme aiming to address asthma in children to consider targeting mothers due to the apparent differences in the management of the disease between the two; the mother being more effective.

Table 2: Age of your child:

Age Group	Frequency (n=250)	Percentage (%)
2-4 years	100	40%
5-8 years	150	60%

From this table, the data reveal that 60 percent of the children in the study were between five to eight years old; 40 percent of the children were between two to four years old. This distribution indicates that the majority of children in consideration are in the later stages of the childhood age range which can have an impact on the child and parent relationship with asthma devices. It may be that older children are more involved in the use of inhalers or nebulizers or that parents think that they can understand some devices better. It also may show the variability of asthma severity or the rate of diagnosis in older versus younger kids since older kids have an established management plan due to prior experience with asthma.

Table 3: Gender of your child:

Gender	Frequency (n=250)	Percentage (%)
Male	155	62%
Female	95	38%

This means that 62 percent of the children involved in the study were boys, while 38 percent were girls. This raises a question of gender bias in the sample; a trend observed by some studies that asthma affects males more than females in early childhood. This is important because the study had more male children than female, because gender differences may exist in how asthma manifests and affects children, including how parents manage it. Certain gender differences should be considered during the development of asthma education or interventions because boys may have asthma more often or of worse severity at early age.

Table 4: Your education level:

Education Level	Frequency (n=250)	Percentage (%)
Primary	45	18%
Secondary	75	30%
Bachelor's Degree	85	34%
Postgraduate	45	18%

The above table gives details of the level of education of the parents of the children in this study. It reveals that 34 percent of the parents had a bachelor’s degree while 30 percent had secondary education. Eighteen per cent of them had only primary education while 18 per cent had post graduate education. Overall, the participants in this study were relatively educated, with the great majority having at least secondary education. Parental education may be a critical factor in determining the extent to which parents grasp and adhere to asthma management recommendations, especially in the context of MDI with spacer or nebulizer usage. Higher educated parents may also be more informed about their child’s condition and this may affect their preference of one device over the other.

Table 5: Household income per month:

Income Level	Frequency (n=250)	Percentage (%)
Below ₹50,000	50	20%
₹50,000 - ₹100,000	120	48%
Above ₹100,000	80	32%

The table above illustrates the participants’ household earnings, with the highest income bracket being ₹50,000 – ₹1,00,000 per month for 48% of participants. Another 32% of the respondents reported earning more than ₹100,000 in a month; 20% of the respondents had an income of less than ₹50,000. This income distribution indicates a middle to upper income sample and may influence the utilisation of

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health care and asthma inhalers. Higher income families can probably purchase MDIs with spacers or nebulizers and receive better health care information. On the other hand, families with limited income may struggle with costs of devices, and/or medications, which may affect their preferences or treatment compliance.

Table 6: Where do you live?

Area	Frequency (n=250)	Percentage (%)
Urban	160	64%
Rural	90	36%

As it is illustrated in this table, 64% of the participants are from urban zone and 36% of them are from rural zone. The difference between the population living in urban and rural areas can affect the availability of health care and information about asthma devices for self-management. In contrast, the parents living in urban environments may have better access to the healthcare professionals, education, and treatments that are available for asthma, while the parents This difference may also be due to variation in the level of knowledge regarding appropriate device use, wherein rural parents may be less knowledgeable or less likely to have gained more comprehensive asthma education.

4.2: Asthma Management

Table 7: Which device does your child currently use for asthma treatment?

Device	Frequency (n=250)	Percentage (%)
MDI with Spacer	115	46%
Nebulizer	135	54%
Both MDI and Nebulizer	0	0%

In this study, 54% of the children are on nebulizers, 46% are on MDI with spacer, and none of the parents are using both. This implies a preference for nebulizers, probably because of factors of convenience or efficacy in managing acute asthma attacks. It is evident that MDIs with spacers are also popular, which means that they could be more suitable for many parents; however, the study may have to establish why some parents prefer ne This could be due to the parents' awareness of the device or the child's ease with one device over the other.

Table 8: How often does your child experience asthma symptoms?

Symptom Frequency	Frequency (n=250)	Percentage (%)
Daily	40	16%
Weekly	110	44%
Monthly	60	24%
Rarely (few times a year)	40	16%

According to the data, 44 per cent of children complain of asthma symptoms at least once a week, while 24 per cent have symptoms every month, 16 per cent have symptoms daily, and another 16 per cent have symptoms only occasionally (a few times per year). These results reveal that asthma is quite common among the children in the study, as four out of every ten were having symptoms at least once a week. It may be that the frequency of symptoms will dictate device choice as parents of children who experience symptoms often will prefer a device that they think can provide faster or more efficient relief or is more convenient to use over time. Those using the medication on a daily basis may benefit from nebulizers while those whose children have less frequent symptoms may require MDIs with spacers.

Table 9: What is the severity of your child's asthma?

Severity Level	Frequency (n=250)	Percentage (%)
Mild	60	24%
Moderate	140	56%
Severe	50	20%

Out of the children, 56% have moderate asthma, 24% have mild asthma and 20% have severe asthma. The high prevalence of moderate asthma indicates that the great majority of children in this study should be on regular treatment for symptoms but do not suffer severe attacks very often. This could influence the choice of inhaler, because the parents of children with moderate asthma may be more concerned with the

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long term control and may opt for MDIs with spacers for their ease of use as opposed to the parents of children with severe asthma who may prefer nebulisers because of their perceived efficacy during severe attacks.

4.3: Knowledge of Asthma Devices

Table 10: Are you aware of how to properly use an MDI with a spacer?

Awareness	Frequency (n=250)	Percentage (%)
Yes	175	70%
No	75	30%

About 70% of parents are knowledgeable regarding the right way of using MDIs with spacers while 30% are not. This means that the majority of the people have been educated or informed on how to use this device appropriately. But the 30% who are not aware can be an issue in education which might affect the management of asthma. Parents who do not know how to use MDIs with spacers may have difficulties in following the prescribed treatment regimens of their children, which may result in suboptimal asthma control. This gap suggests that there is room for improvement in the levels of education given by health care givers.

Table 11: Are you aware of how to properly use a nebulizer?

Awareness	Frequency (n=250)	Percentage (%)
Yes	200	80%
No	50	20%

From this table, the current knowledge of parents on correct use of nebulizer is as follows, 80% of parents are informed while 20% are not. The increased understanding of nebulizer usage than MDIs with spacers may be the reason as to why more parents prefer nebulizers (as highlighted in Table 7). Nebulizers can also be considered as easier to use, especially during acute asthma attacks, which is why they are more recognizable. The 20% of parents who had not heard of nebulizer use indicate that, although nebulizers may seem easy to use, more information might be required for proper utilization.

Table 12: Where did you receive information on how to use these devices?

Source of Information	Frequency (n=250)	Percentage (%)
From Doctor or Nurse	180	72%
From Online Sources	40	16%
From Friends/Family	30	12%
No Information Received	0	0%

72% of the parents were informed on how to use their child's asthma device by a doctor or a nurse while 16% got the information from the internet and 12% from friends or relatives. None of the parents surveyed said that they had not received any information. Table 3 provides a summary of the findings and shows how healthcare professionals have an important part to play in informing parents about the use of asthma management devices. It also proposes that, even though they are not used frequently, online materials and other unofficial contacts can also help parents gain some knowledge. The above results suggest that the role of medical personnel is significant, which means that proper and profound information should be given to patients during clinic visits or hospital stays.

4.4: Perceptions and Preferences

Table 13: Which device do you believe is more effective for managing your child's asthma?

Perceived Effectiveness	Frequency (n=250)	Percentage (%)
MDI with Spacer	65	26%
Nebulizer	185	74%

Based on the survey, 74% of parents said that nebulizers are more helpful in managing their child's asthma than MDIs with spacers 26%. This preference for nebulizers may be due to the fact that the patients believe that they provide faster and better relief during an acute asthma attack. It could also be easier for the parents to use a nebulizer as it gives a visible output to the parents which could be reassuring. Lower use of MDIs with spacers may be due to lack of belief in

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their efficacy which may be due to lack of information or practise on how to use them.

Table 14: How often do you use the nebulizer for your child?

Nebulizer Usage	Frequency (n=250)	Percentage (%)
Daily	75	30%
Weekly	100	40%
Only during acute attacks	75	30%

Frequency of nebulizer use reveals that 30% of parents administer nebulizers on daily basis while 40% of parents use it on weekly basis while the remaining 30% use it during acute attack only. This distribution indicates that nebulizers are used often by many parents to address routine care or for the management of acute episodes. The high usage rates in terms of weeks and days reveal that nebulizers are seen as useful and easy to use for daily asthma control, especially for children who have more severe or more frequent symptoms.

Table 15: How often do you use the MDI with spacer for your child?

MDI with Spacer Usage	Frequency (n=250)	Percentage (%)
Daily	50	20%
Weekly	125	50%
Only during acute attacks	75	30%

Parents of MDI users with spacers suggest daily use 20%, weekly use 50% and during acute attack 30%. This lower daily usage as compared to nebulizers maybe because parents consider MDIs with spacers as tools for less frequent use or when asthma is not very severe. Nevertheless, the finding that half of the parents reported using them on a weekly basis suggests that MDIs with spacers are still perceived as a readily available approach to managing asthma on a routine basis.

Table 16: Are you satisfied with the information provided about using these devices?

Satisfaction Level	Frequency (n=250)	Percentage (%)
Very Satisfied	80	32%
Satisfied	100	40%
Neutral	50	20%
Dissatisfied	20	8%

The satisfaction levels in this table reveal that, 40 percent of parents are OK with the information given, 32 percent are very OK, 20 percent are neutral, while 8 percent are not OK. This shows a generally favourable perception of the information parents received about asthma devices, however; the 20% neutral and 8% negative feedback suggest that there is potential for further improvement in the communication process. It may also be useful to enhance the information provided to patients regarding both MDIs with spacers and nebulizers to enable them to use them correctly.

4.5: Barriers to Use

Table 17: Have you faced any difficulty using the MDI with spacer?

Difficulty in Usage	Frequency (n=250)	Percentage (%)
Yes	50	20%
No	200	80%

This table reveals that, 20 percent of the parents have had challenges in using MDI with spacer, 80 percent have not. This relatively low difficulty rate therefore indicates that MDIs with spacers are regarded as being quite feasible once parents have been made aware of how to use them. However, the 20% of parents who have problems may require additional education and guidance to ensure correct utilization of the device, misuse of which may result in poor asthma control.

Table 18: Have you faced any difficulty using the nebulizer?

Difficulty in Usage	Frequency (n=250)	Percentage (%)
Yes	100	40%
No	150	60%

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The table shows that, 40 percent of parents have had a challenge in handling the nebulizer while 60 percent have not. This is a much higher rate of difficulty than for MDIs with spacers, which may be because of the practicalities of preparing and cleaning nebulizers. This is important for future work to address these issues, and particularly for parents who are using nebulizers, because the difficulties with the device may impact on asthma control.

Table 19: What are the main challenges you face in using these devices?

Challenges Faced	Device	Frequency (n=250)	Percentage (%)
Difficulty in Usage	Nebulizer	100	40%
	MDI with Spacer	50	20%
High Cost	Nebulizer	80	32%
	MDI with Spacer	30	12%
Lack of Information	Nebulizer	50	20%
	MDI with Spacer	75	30%

Nebulizers are more problematic for 40% of parents, as opposed to 20% for MDIs with spacers. Thirty two percent of the nebulizer users reported cost to be a concern while only 12% of the MDI with spacer users felt the same. This shows that information gap is higher for spacer users at MDI (30%) than nebulizer users at MDI (20%). These challenges point out a number of issues that need to be addressed such as the financial impact of nebulizers on families, and the need to educate parents on proper use of MDIs with spacers. Asthma management may be improved by tackling these issues.

Table 20: Which device would you prefer to use for your child in the future?

Future Device Preference	Frequency (n=250)	Percentage (%)
MDI with Spacer	100	40%
Nebulizer	150	60%

As seen in the table below, 60% of the parents stated that they would like to continue nebulizers, whereas 40% of the parents stated that they would like to use MDIs with spacers. The choice of nebulizers may indicate that parents find them more convenient, or believe that they are better for their child's asthma when compared to inhalers. Nevertheless, the results showing a substantial proportion of patients with a preference for MDI spacers suggest that, given adequate education and encouragement, MDI spacers could become more widely used in asthma care, especially for mild to moderate asthma.

Discussion:

The results of this research suggest that there is strong parental preference for nebulizers as opposed to MDIs with spacers for the treatment of asthma in children between two and eight years of age. Given that 74% of parents believe that nebulizers are more effective than metered dose inhalers, it is imperative to determine the rationale for this preference since the two devices are reported to be equally effective in the delivery of asthma medications (Batra et al.) Parents may think that nebulizers offer quick and clear results that are easily recognizable in the course of acute asthma attacks. This may be because 54% of parents use nebulizer for routine asthma control despite the fact that MDI with spacer is easier, safer and cheaper in the long run (Leversha et al., 2000).

This knowledge is very important in determining the perceptions that children have. Despite the high parental awareness of how to use MDIs with spacers correctly (70%), however, 30% parents remain ignorant. This lack of knowledge can explain the choice of nebulizers as it might be easier and less confusing for parents or more understandable during an acute attack (Conn et al., 2007). Nebulizers with visible fog may make the parents This means that targeted education should continue in an effort to make parents more comfortable in using MDIs with spacers.

Based on this, healthcare providers are in the right place to help solve these knowledge **gaps.** While seventy two percent of parents received information from a doctor or nurse about the asthma devices, twenty percent struggled to use the nebulizer and thirty percent were not well informed on the use of MDIs This alerts a need for better communication and perhaps more detailed demonstration of procedures during the OPD visit. Previous studies have established that parents who are given specific information by healthcare givers are more likely to follow the recommended treatments and use devices as required (Aliyu et al., 2018). Thus, improving the quality of education delivered by health care givers may help to narrow the gap and create a more balanced perception between MDIs with spacers and nebulizers.

Some of the other factors that appeared as important in influencing parental preferences included cost and convenience. More parents noted that they worry about the cost of nebulizers (32%) than the cost of MDI with a spacer (12%). Although nebulizers are thought to be more efficient, they also carry a higher price tag, which may prove problematic for some

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families (Jamalvi et al., 2006). However, MDIs with spacers, though considered by some parents to be less effective than nebulizers, are less expensive and easier to transport, thus being more convenient for long term management of asthma (Delgado et al., 200 This implies that if misconceptions held by parents on the effectiveness of MDIs with spacers are dispelled and emphasis made on the cost and convenience, MDI with spacers use may increase.

The findings of this study also show that there is inequity in the management of asthma between the urban and rural population. There may be a lack of access to paediatric asthma care together with limited access to educational materials in the rural setting, which may affect parental choice and understanding. This is consistent with previous research that indicates that, for example, parental education and socioeconomic factors may have a strong influence on asthma care practises (McQuaid et al., 2009). Targeted educational programmes for paediatric asthma should consider these disparities, especially in the rural areas; this may enhance the management of paediatric asthma since all parents will have equal knowledge and access to managing their child's asthma.

Conclusion:

The study showed that parents had a strong preference for nebulizers even though both MDIs with spacers and nebulizers have been found to be equally effective clinically. A knowledge deficit with regard to the correct use of MDI was revealed, thus underlining the importance of the study. However, while most of the parents were provided with information by the healthcare professionals, they face barriers including cost of the device, difficulty in using the device, and lack of information. The above problems can be dealt with by providing education and support that is specific to the issue of asthma management and compliance with medication regimes. It is imperative to equip parents with the knowledge and confidence in regard to using MDIs with spacers to improve the children's subsequent asthma control.

References:

1. Batra V, Sethi GR, Sachdev HP. Comparative efficacy of jet nebulizer and metered dose inhaler with spacer device in the treatment of acute asthma. *Indian Pediatr.* 1997;34:497–503.
2. Beliefs and barriers to medication use in parents of Latino children with asthma. McQuaid EL, Vasquez J, Canino G, et al. *Pediatr Pulmonol.* 2009;44:892–898.
3. Benito-Fernandez J, Gonzalez-Balenciaga M, Capape-Zache S, Vazquez-Ronco MA, Mintegi-Raso S. Salbutamol via metered-dose inhaler with spacer versus nebulization for acute treatment of pediatric asthma in the emergency department. *Pediatr Emerg Care.* 2004;20:656–659.
4. Brannan JD, Lougheed MD. Airway hyperresponsiveness in asthma: mechanisms, clinical significance, and treatment. *Front Physiol.* 2012;3:460–460.
5. Castro-Rodriguez JA, Rodrigo GJ. A systematic review of long-acting beta2-agonists versus higher doses of inhaled corticosteroids in asthma. *Pediatrics.* 2012;130:e650–e657.
6. Chong HJ, Neto, Chong-Silva DC, Marani DM, Kuroda F, Olandosky M, Noronha L. Different inhaler devices in acute asthma attacks: a randomized, double-blind, placebo-controlled study. *J Pediatr (Rio J)* 2005;81:298–304.
7. *Collaboration Cochrane Review Manager (RevMan)* Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration; 2011. Computer program.
8. Delgado A, Chou KJ, Silver EJ, Crain EF. Nebulizers vs metered-dose inhalers with spacers for bronchodilator therapy to treat wheezing in children aged 2 to 24 months in a pediatric emergency department. *Arch PediatrAdolesc Med.* 2003;157:76–80.
9. Global Initiative for Asthma *Global Strategy for Asthma Management and Prevention.* 2016. [2017 Feb 27]. homepage on the Internet. Available from: http://www.ginasthma.org/
10. Jamalvi SW, Raza SJ, Naz F, Shamim S, Jamalvi S. Management of Acute Asthma in children using metered dose in inhaler and small volume nebulizer. *J Pakistan Med Assoc.* 2006;56:595–599.
11. Kerem E, Levison H, Schuh S, O'Brodovich H, Reisman J, Bentur L, et al. Efficacy of albuterol administered by nebulizer versus spacer device in children with acute asthma. *J Pediatr.* 1993;123:313–317.
12. Leversha AM, Campanella SG, Aickin RP, Asher MI. Costs and effectiveness of spacer versus nebulizer in young children with moderate and severe acute asthma. *J Pediatr.* 2000;136:497–502.
13. Parental beliefs about medications and medication adherence among urban children with asthma. Conn KM, Halterman JS, Fisher SG, et al. https://www.sciencedirect.com/science/article/abs/pii/S1530156705603681 *Ambulatory Pediatr.* 2005;5:306–310.
14. Parental perceptions about the use of Metered dose inhaler vs Nebulizer in children with acute asthma exacerbation. [Sep;2020];Nambiar G, Rimareva N, Krata L. https://pediatrics.aappublications.org/content/142/1_MeetingAbstract/582 2018.
15. Parental perceptions and beliefs about childhood asthma: a cross-sectional study. Zaraket R, Al-Tannir MA, Abdulhak AAB, et al. *Croatian Med J.* 2011;52:637–643.
16. Parental perceptions and practices toward childhood asthma. Abu-Shaheen AK, Nofal A, Heena H. *BioMed Res Int.* 2016;2016:6364194.
17. Parental perceptions of their child's asthma: management and medication use. Peterson-Sweeney K, McMullen A, Yoos HL, et al. *J Pediatr Health Care.* 2003;17:118–125.
18. Psychosocial factors and asthma. Bosley CM, Cordenand M, Cochrane GM. *Respir Med.* 1996;90:453–457.
19. Sannier N, Timsit S, Cojocaru B, Leis A, Wille C, Garel D. Traitement aux urgences des crises d'asthme par nébulisations vs

DOI: 10.69605/ijlbpr_13.11.2024.118

chambresd'inhalation. *Arch. Pédiat.* 2006;13:238–244.

20. Vilarinho L, Mendes CM, Souza L. Metered-dose inhalers with home-made spacers versus nebulizers to treat moderate wheezing attacks in children. *J Pediatr (Rio J)* 2003;79:403–412.
21. Yilmaz O, Bakirtas A, Ertoy Karagol HI, Topal E, Demirsoy MS. Allergic rhinitis may impact the recovery of pulmonary function tests after moderate/severe asthma exacerbation in children. *Allergy.* 2014;69:652–657.
22. Zamboni A, Thommazo A, Hernandes E, Fabbri SC, editors. StArt Uma Ferramenta Computacional de Apoio à Revisão Sistemática; Proceedings of the Congresso Brasileiro de Software (CBSoft'10); 2010 Sep 27-Oct 1; Salvador, Brazil. 2010.