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Assessment of Nebulizer Therapy Knowledge among Mothers of Children with Asthma

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ABSTRACT

Objective(s): To assess of mothers' knowledge of using nebulizer therapy for their children with asthma, and to find out the relationship between the mother knowledge and their socio-demographic characteristics.

Methods: Descriptive study design was conducted at Ibn- Albaladi Hospital for Maternity and Child. Data were collected from October 10th, 2022 to January 10th, 2023. Purposive non-probability sample consisting of 50 mothers of children with asthma was admitted to the hospital. Data were collected through the interview technique using questionnaire consisting of: 11 items regarding mothers sociodemographic characteristics; and 19 items related to the use of nebulizer therapy for their asthmatic children. Data was analyzed by using descriptive and inferential statistical.

Result: The results showed that most mothers had moderate level knowledge toward using of nebulizer therapy for their children with asthma with (58%) of them, with arithmetic mean of (M±SD= 2.19±0.305). There was no significant correlation between mothers' age, marital status, family income, and their level of knowledge at ($P < 0.05$).

Conclusion: The study concludes that mothers' level of knowledge regarding the using of nebulizer therapy was at moderate level.

Recommendations: This study emphases applying and distributing of instructional pamphlets among mother of children with asthma regarding using nebulizer therapy and enhancing their knowledge through social media to improve their practice.

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تقييم معارف علاج المرذذ بين الأمهات الأطفال المصابين بالربو

المستخلص

الأهداف: هدفت الدراسة لتقييم معارف الأمهات حول استخدام علاج المرذذ (البخاخ) لأطفالهن المصابين بالربو ومعرفة العلاقة بين معارف الأمهات والصفات الديموغرافية.

المنهجية: أجريت دراسة وصفية في مستشفى ابن البلدي للأطفال والنسائية حيث تم جمع البيانات من الفترة من ١٠ تشرين الاول ٢٠٢٢ إلى ١٠ كانون الثاني ٢٠٢٣. تم اختيار عينات هادفة (غير محتملة) متكونه من ٥٠ أم من الاطفال المصابين بالربو الذين أدخلوا إلى المستشفى. تم جمع عينة الدراسة عن طريق الاستبيان المكون من (11 فقرة) حول الصفات الديموغرافية للأمهات وايضا يتضمن)١٩) فقرة حول استخدام العلاج المرذذ للأطفال المصابين بالربو, تم تحليل البيانات باستخدام الإحصاء الوصفي والاستدلالي.

النتائج: أظهرت النتائج أن أكثر من نصف الأمهات المشاركات لديهن مستوى معتدل من المعارف تجاه استخدام العلاج المرذذ لأطفالهن المصابين بالربو في عينة الدراسة (58٪) ، مع المتوسط الحسابي والانحراف المعياري (2.19 ± 0.305). ولا توجد علاقة ارتباطية ذات دلالة إحصائية بين عمر الأمهات وحالتهن الزوجية ودخل الأسرة ومستوى معرفتهن عند.($P<0.05$)

الاستنتاجات :أخلصت الدراسة إلى أن مستوى المعارف للأمهات المشاركات فيما يتعلق باستخدام العلاج المرذذ كان مستوى متوسطا .

التوصيات: توصي الدراسة بضرورة تحسين معارف الامهات من خلال إعطائهن محاضرات أثناء الدخول الى الردهة الباطنية، أو كتيبات ارشادية لزيادة معارف الأمهات حول استخدام العلاج المرذذ في المنزل ومن خلال وسائل التواصل الاجتماعي.

الكلمات المفتاحية: معارف, الأمهات، المرذذ (البخاخ), الأطفال المصابين بالربو.

Introduction

Asthma is a heterogeneous, chronic respiratory disorder characterized by inflammation of the airway and hyperresponsiveness that impact health and quality of life [(1)].

The disability and mortality of premature children across many low and middle-income countries are within a high percentage. Over 260 million people had poorly controlled asthma, according to the Global Burden of Disease (GBD) [(2)].

The prevalence of asthma among children and adolescents in Brazil was 24.3% and 19% respectively, with a high count in urban centers of the north and northeast [(3)].

In children, asthma is the most prevalent chronic illness. Globally, it impacts around 330 million individuals. As we previously discussed, environmental and genetic variables influence the prevalence of asthma, which varies by location. The proportion of children in Saudi Arabia, an Arab nation that borders Iraq, who suffer from asthma, varies depending on the governorate. In Al-Hofuf Governorate, the number was as high as 33%, while in Abha Governorate, it was as low as 9% [(4)].

Over the second half of the 20th century, there was a recorded increase in asthma cases in various areas of the world. An asthma is an infectious disease that usually affects children. Explore the correlations between asthma symptoms, medication use, and asthma severity in children, as well as the prevalence patterns of asthma [(5)].

Children with mild or moderate asthma can benefit from appropriate control by avoiding triggers and/or with the assistance of medications. The Global Initiative for

Asthma (GINA) will offer detailed information in 2023 regarding step 1 asthma treatment for children younger than five years old. Though intermittent short-course ICS can be used during the outset of sickness, there is not enough evidence to support daily controller use [6].

Two-way pharmacological and nonpharmacological interventions are necessary for comprehensive care of asthma in order to achieve the best possible results. Many drugs, such as beta-2 adrenergic agonists and corticosteroids, are used in the pharmacological treatment of childhood asthma. These medications are crucial for symptom management and asthma attack prevention. The frequency of asthma exacerbations can be decreased, and quality of life can be enhanced by non-pharmacological interventions such as lifestyle changes, avoiding recognized triggers (such as smoke and allergens), and environmental controls [7].

Children who suffer from asthma account for a considerable percentage of visits to the emergency room. Inhalation therapy remains the best route of treatment in such children both during asthma exacerbation and during the maintenance phase of therapy due to the ease of administration and quick onset of action. Drugs actually receiving the lungs and being available for action are largely influenced by inhalation technique, device type that can be used, and the fine particle dose of the drug [8].

Nebulizers use liquid-based solutions and suspensions to produce aerosols. Nebulizers work particularly well with a variety of liquid formulations and can administer higher dose of medication than are practical with inhalers [9].

The nebulizer therapy is safer, more effective, and has fewer adverse effects. They are effective in the treatment of moderate to severe asthma [10].

Thus, the aims of the current study are to assess mothers' knowledge toward using nebulizer therapy for their children with asthma and to find out the relationship between the mother knowledge and their sociodemographic characteristics, such as mother age and level of education, with using the nebulizer therapy.

Methods

Study Design

The study was planned as a descriptive study to assess level of mothers' knowledge whose children with asthma receive nebulizer therapy. Was conducted in Ibn-Albaladi Hospital for Child and Maternity in Baghdad City.

The Study Sample and Sampling

The selection of the sampling was using the non-probability sample (purposive sample); the population of the study consisted of mothers' (N = 50) whose children were admitted to medical wards and treated by using nebulizer therapy. Mothers were chosen to fulfill the inclusion criteria when they live in Baghdad City exclusively and mothers of children diagnosed with asthma. Exclusion criteria included mothers' who lived outside of Baghdad City and the undiagnostic of children with asthma.

Data Collection and the Study Instrument

The data were collected through a formed paper-based questionnaire to carry out the aims of the study. The questionnaire was developed by the researcher based on the related literatures and guideline-related of using nebulizer therapy and written in clarity language of Arabic. The questionnaire involved Mothers' sociodemographic characteristics such as age, educational level, marital

status, occupational status, type of family, income, residential, history of asthma in family, presence of smoker in the house, presence of animals in the house, and using the nebulizer therapy at home. The questionnaires also included Mothers' knowledge about using nebulizer therapy that designed to assess mothers' level of knowledge regarding using nebulizer therapy for their children with asthma. It contained 19 items about using nebulizer therapy. The answers to these items are in the form of (know, take score = 2, do not know = 1, and uncertain = 0).

The participants filled out the questionnaires at the medical ward of the hospital and distributed according to the code of the questionnaire. To ensure the data quality and completeness, the questionnaire could be completed only once and with all questions answered. The researcher assisted participants in completing the questionnaires and checked all questionnaires for completeness; questionnaires with incomplete answers were considered and excluded from analysis.

The Instrument Validity and Reliability

To maintain the tool's validity, the questionnaire was distributed to thirteen experts with experiences in the medical and nursing fields. The experts reviewed the tools for clarity, scientific content, simplicity and comprehensiveness of the subject. There were minor modifications to the questionnaire used to collect the sample. Cronbach alpha reliability was used to quantify the internal consistency of the instruments and evaluate their reliability and found that the correlation coefficient was (0.866) which is acceptable.

Ethical Considerations

Approvals to conduct this study were obtained from Ethics Committee in the College of Nursing, University of Baghdad before starting the study. Also, approval was obtained from Ibn-Albaladi Hospital for Child. Mothers' who met the inclusion criteria provided with written informed consent, which was granted before starting study.

Data Analysis

After being received, all of the data was initially entered into a Microsoft Excel sheet and subsequently analyzed using the statistical package (SPSS) version 21. The descriptive statistics was used (mean, standard deviation, and frequency of the results were displayed as suitable. The study used the student t-test to compare continuous variables, and Pearson correlation was used to identify correlations between mother knowledge and other variables.

Results

Table 1. Socio-demographic characteristics for mothers of children with asthma (N=50)

No.	Socio-demographic characteristics	Categories	F	%
1.	Age	20-25	9	18%
		26-30	8	16%
		31-35	15	30%
		36-40	10	20%
		41-45	8	16%
2.	Level of Education	Illiterate	1	2%
		Read and write	5	10%

		Primary graduate	13	26%
		Secondary graduate	10	20%
		Medical institute graduate	10	20%
		College graduate and more	11	22%
3.	Marital Status	Married	**34**	**68**%
		Separated	7	14%
		Divorced	3	6%
		Widow	6	12%
4.	Occupational Status	Housewife	**31**	**62**%
		Employment	19	38%
5.	Type of Family	Small Family	25	50%
		Extended Family	25	50%
6.	Income of Family	Sufficient	18	36%
		Not Sufficient	8	16%
		Barely sufficient	**24**	**48**%
7.	Residential	Urban	22	44%
		Sub urban	**24**	**48**%
		Rural	4	8%
8.	History of asthma in the Family	Yes	20	40%
		No	**30**	**60**%
9.	Presence of Smoker in the House	Yes	**33**	**66**%
		No	17	34%
10.	Presence of Animals in the House	Yes	19	38%
		No	**31**	**62**%
11.	Using the Nebulizer Therapy in the House	Yes	**23**	**46**%
		No	27	54%

No= number**, F=** Frequencies**, %=** Percentages.

Table (1) shows that mothers were married with (68%), housewife (62%), having (3-4 children) (62%) and their income were somehow sufficient (48%). The results also reveals that 48% of mothers were lived in sub-urban, more than half of them have 3-4 bedrooms in their houses (52%), while number of persons in one bedroom were 3-4 persons with in (48%) of them. In addition, most of those mothers (60%) haven't had a history of asthma in their family, having smokers in the house (66%), (62%) of them have not had animals in the house. Finally, (46%) of the mothers were using the nebulizer at home.

Table2. Mothers' knowledge toward using of nebulizer therapy for their children with asthma

No.	Items	Know F (%)	Do not know F (%)	Uncertain F (%)	Mean	Std. Dev.	Ass.
1	Nebulizer therapy is efficient route for small baby and children with asthma	34 (68%)	2 (4%)	14 (28%)	2.40	0.904	G
2	Continuous using of nebulizer therapy when the child asthma attack	34 (68%)	12 (24%)	4 (8%)	2.60	0.639	G
3	Using the nebulizer therapy in house more comfort from hospital	36 (72%)	2 (4%)	12 (24%)	2.48	0.863	G

4	The nebulizer therapy is electric machine which convert drug from liquid to mist by inhalation	19 (38%)	7 (14%)	24 (48%)	1.90	0.931	M
5	The best time using of nebulizer therapy when child sleep or after meals	7 (14%)	18 (36%)	25 (50%)	1.64	0.722	L
6	Using Restraining baby during the nebulizer therapy to correct taken treatment	6 (12%)	20 (40%)	24 (48%)	1.64	0.693	L
7	Using dolls and booklets that figures to attractive the child during using nebulizer therapy	12 (24%)	21 (42%)	17 (34%)	1.90	0.763	M
8	Causes the nebulizer therapy side effect more than medication taken by oral or intramuscular injection	26 (52%)	15 (30%)	9 (18%)	2.34	0.772	G
9	Using medication such as Ventolin and pulmacort in nebulizer therapy under physician consultation	45 (90%)	4 (8%)	1 (2%)	2.88	0.385	G
10	Correct dosage of drug when using nebulizer therapy	33 (66%)	8 (16%)	9 (18%)	2.48	0.789	G
11	Cause the nebulizer therapy vomiting, headache palpation and dry mouth after using	13 (26%)	20 (40%)	17 (34%)	1.92	0.778	M
12	Duration of using the nebulizer therapy between 5-10 minute or sometimes 10-15 minute according to dosage drug	31 (62%)	5 (10%)	14 (28%)	2.34	0.895	G
13	Regulation time when using the nebulizer therapy	29 (58%)	18 (36%)	3 (6%)	2.52	0.614	G
14	Frequency using of nebulizer therapy may be achieve 4-6 per day and according to condition of child	13 (26%)	9 (18%)	28 (56%)	1.70	0.863	M
15	Treatment which put in nebulizer therapy may be long action rather than treatment which taken by oral or intravenous infusion	21 (42%)	17 (34%)	12 (24%)	2.18	0.800	M
16	The effectiveness of treatment decreases due to the running out of dose when the face mask or mouth piece is not applied	20 (40%)	12 (24%)	18 (36%)	2.04	0.880	M
17	Cleaning the machine after using	27 (54%)	11 (22%)	12 (24%)	2.30	0.839	M
18	The nebulizer therapy is very expensive and cannot be provided at home	24 (48%)	20 (40%)	6 (12%)	2.28	0.671	M
19	The continuous and permanent use of the nebulizer therapy causes the child's addiction	30 (60%)	13 (26%)	7 (14%)	2.12	0.627	M

No= numbers, **F**= frequencies, **%**= Percentages, **M**= mean of score**. Ass.**= assessment**, assessment levels : (> 0.33) = Poor; (0.33-0.66) = Moderate; (0.67-1.00) = High.**

Table (2) reveals that mothers have a moderate level of knowledge toward using of nebulizer therapy for their asthmatic children was at moderate level extent by items

(4,7,11,14,15,16,17,18 and 19). There was a strong degree of knowledge and understanding demonstrated by the items (1,2,3,8,9,10,12, and 13). Mother shows a low level of knowledge in items 5 and 6 with inadequate comprehension.

Table3. Relationship between mothers' knowledge and their socio-demographic characteristics

Socio-demographic characteristics	Pearson Correlation		
	χ2obs.	df	P value
Age	10.624	8	0.224
Level of education	**45.208**	**10**	**0.000***
Marital status	10.398	6	0.109
Occupational status	**9.938**	**2**	**0.007***
Type of family	8.350	2	0.015
Income of family	4.267	4	0.371
Residential	**14.640**	**4**	**0.006***
History of asthma in family	**7.451**	**2**	**0.024***
Smoker in the house	**12.664**	**2**	**0.002***
Animals in house	**9.818**	**2**	**0.007***
Using the nebulizer therapy in house	**39.522**	**2**	**0.000***

χ2obs. = chi-square**, df=** degree of freedom**, p** = probability value**, P < 0.05= Significant, P < 0.01= High Significant, P > 0.05= non-significant.**

Table (3) show that there was significant relationship between mothers' knowledge toward using of nebulizer therapy for their children with asthma and their socio-demographic characteristics; educational level p value= 0.000, occupation p value= 0.007, residential p value= 0.006, family history with asthma p value= 0.024, the presence of smoker in their house, animals in house and using of nebulizer therapy at home) at (P < 0.05). Regarding mother age, marital status, income of family, showed non-significant association with their knowledge at (P < 0.05).

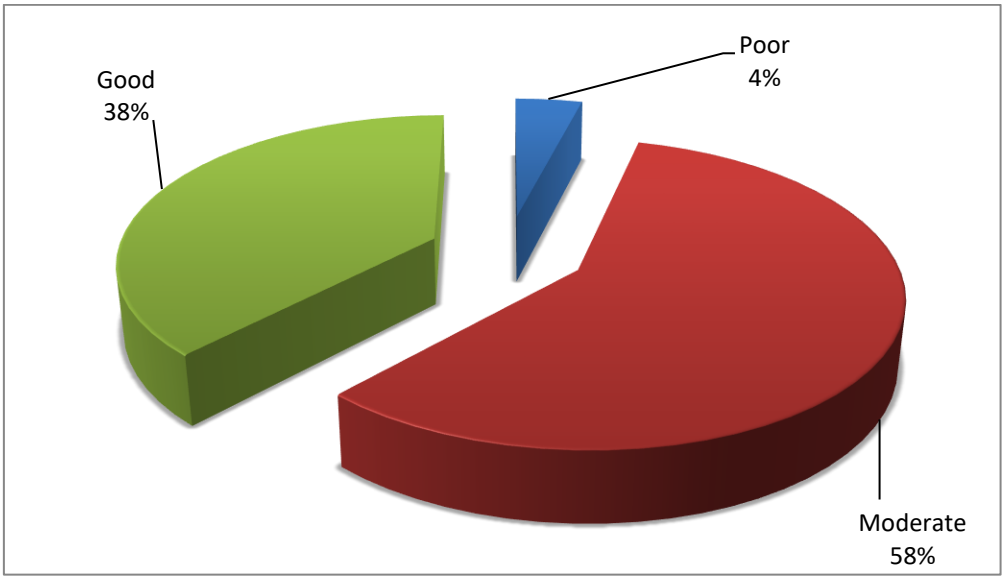

Figure 1. Mothers' knowledge toward using of nebulizer therapy.

Figure (1) shows that (58%) of mothers have a moderate level of knowledge regarding using of nebulizer therapy for their children with asthma.

Discussion

The finding of the study samples the mothers were married, and this finding is consistent with that of a survey in 2022 found 69% of participants were married [(11)]. The study sample reveals that most mothers were housewives. This is consistent with a previous study in (2021) who conducted in Iraq showed that the majority (93.3%) of respondents were housewives [(12)]. The type of family shows that equal result between small and extended family, it presents for each 25 (50%). This result disagreement has been found in an Iraqi survey reported in 2015 that most families were extended [(13)].

Moreover, the family income of those mothers demonstrated that almost half were somehow sufficient. This finding similar to the previous study in 2022 who stated that most of participants were perceive barely sufficient monthly income (14). Also, this study highlighted that less than half of mothers were lived in sub-urban areas. This finding is disagreed with the study conducted in Kirkuk, Iraq found that (72%) of mothers were lived in sub-urban areas [(15)].

The study's findings indicate that 60% of mothers do not have a history of asthma in their children and 62% do not have animals at home. The previous study in (2023) confirmed that a family history of asthma is among the factors contributing to the rise in asthma rates, as indicated by the study's disagreement results [(16)]. However, the result reveals that 66% of mothers whose children suffer from asthma have smokers lived with them at home and not presence of animals in the house (62%). According to the previous study in 2023 confirmed that smoking and presence of animals are uncommon to be a factor in the effect of asthma [(17)].

The study revealed that mothers had a moderate level of knowledge regarding the using of nebulizer therapy except using a restraining baby during the nebulizer therapy to correct taken treatment, whose knowledge can be low with limited knowledge. A previous study in 2019 who assess knowledge of practice regarding the physical restraining of patients among staff nurses and confirmed that restraining is one of the most common procedures performed in different medical interventions (nebulizers, venipuncture, etc.). The purpose is to restrain patient safety, control aggressive behavior, and maintain management protocols [(18)].

The current study confirmed that mothers' knowledge is low regarding the best time to use nebulizer therapy when children are sleeping or after meals. In contrast, a previous study in 2023 confirmed that when the nebulizer mist is applied by wafting it in front of an uncooperative, weeping child. Because of the loss of nebulizer dosage to the atmosphere, this approach is deemed inefficient. Using the nebulizer on a sleeping infant or toddler is another way to administer the treatment, with the hope that it won't wake them up and make them aggressive [(19)].

The results of the study show that there is no statistically significant relationship between the mother's knowledge about the use of nebulizer with sociodemographic data (age, marital status, income of family). These results are in agreement with a study conducted in 2023 demonstrated that the relationship between sociodemographic data (age, marital status, income of family), and knowledge is not significant [(20)].

However, the level of education, occupation status, type of family, resident

There were significant relationships between the mother's knowledge about the use of nebulizer at ($P < 0.05$). This result agreed with a study in 2024 demonstrated there were statistically significant differences in the relationship between mothers' knowledge and their educational level, residence, type of family, and occupation status [(21)].

Additionally, the family history of asthma, the presence of a smoker in the house, and presence of animals in the house, and using of nebulizer therapy at home had significant relationships with mothers' knowledge this result is compact with a study in 2023

confirmed the family histories and factors such as smoking and animal their contribution to asthma risk prediction in children and significant relationship with mothers' knowledge [22].

Parents of children with asthma should be given informational pamphlets about nebulizer therapy and how to use it, as well as opportunities to network with other mothers on social media to enhance their practice. The majority of the mothers in the research sample came from homes where smoking is a common practice, which is one of the main factors aggravating asthma

Conclusion

This study demonstrates that mothers of children with asthma had an overall moderate level of knowledge about the use of nebulizer therapy. The study indicates the sociodemographic characteristics' (educational level, occupational status, residential, presences of smoker and presence of animals at home) have an effect on mothers' knowledge.

Recommendations

This study emphasizes the application and distribution of instructional pamphlets among mothers of children with asthma regarding using nebulizer therapy and enhancing their knowledge through social media to improve their practice.

Conflict of Interest

None

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References

1. Indolfi C.,et al., Treatment of Severe Asthma: Case Report of Fast Action of Mepolizumab in a Patient with Recent SARS-CoV-2 Infection, Multidisciplinary Digital Publishing Institute, 2024;14(9
2. Song P etal.,Global, regional, and national prevalence of asthma in 2019: a systematic analysis and modelling study, Journal of global health, 2022,12:04052.
3. Zacaron D. et al.,Prevalence and impact of asthma in schoolchildren in the city of Caxias do Sul-RS, Journal de pediatria, 2020; 96(4):479-486.
4. Ibraheem A., et al., Asthma prevalence among Iraqi children, Al-Salam Journal for Medical Science, 2024; 3(1):17-21, :
5. Hedman L.et al., Is asthma in children still increasing? 20-year prevalence trendsin northern Sweden, Pediatric Allergy and Immunology, 2024;35.
6. Pleșca D.,et al., Asthma prevention and recent advances in management, Global Pediatrics,2024; 9 (1).
7. Ibraheem A., et al., Clinical profiles, severity, and risk factors of pediatric asthma in Baghdad: A comparative study of early onset and late-onset cases, International Journal of Pediatrics and Neonatology,2024; 6(2):109-113,
8. Kumari P. et al., Appropriateness of Inhalational Therapy use among Children with Bronchial Asthma: Experience of a Tertiary Care Center, International Journal of Life Sciences, Biotechnology and Pharma Research, 2024;13(6): 503-507.
9. Fink. J and Stapleton K., Nebulizers, Journal of Aerosol Medicine and Pulmonary Drug Delivery, 37 (3)
10. Santati .S, Thongsri J and Sarntima P., Modified Small-Volume Jet Nebulizer Based on CFD Simulation and Its Clinical Outcomes in Small Asthmatic Children, Journal of Healthcare Engineering, 2019
11. Redan Zahraa S. and Ajil Zaid W., Assessment of Teachers' Knowledge about Hemophilic Students in Primary

Schools, Mosul Journal of Nursing, 2022,10(3):147-153.
12. Fadhil S., Ali R. and Salman A. Assessment of Potential Factors that Effect Women Response to Labor Pain at Al-Elwyia Maternity Teaching Hospital, Medico-legal Update, 2021, 21(2): 1094-1098.
13. Shauq A., Burden of Mothers´ Care for Children with Colostomy at Baghdad Medical City Teaching Hospital, Iraqi National Journal of Nursing Specialties, 2015, 28(2):8
14. Sabit E. and Fadhil S., Assessment of Self-esteem level among Women with Spontaneous Abortion, Pakistan Journal of Medical & Health Sciences, 2022, 16(4): 892-896.
15. Ameen B., Mothers Information Regarding Asthmatic Child Care in Kirkuk City, Iraqi National Journal of Nursing Specialties, 2015; 28(2): 83-92.
16. Triasih et al., Prevalence, Management, and Risk Factors of Asthma Among School-Age Children in Yogyakarta, Indonesia, Journal of Asthma and Allergy, 2023;16(1):23-32.
17. Lin H and Li H, How does cigarette smoking affect airway remodeling in asthmatics?, Tobacco Induced Disease, 2023; 21(13):1-14.
18. John M et al., The Knowledge on Practice Regarding Physical Restraining of Patients among Staff Nurses, International Journal of Health Sciences & Research, 2019;9(10): 232-237.
19. Handley J., Does the use a vibrating Mesh Nebuliser through a high flow nasal cannula compared to the Jet Nebuliser improve nebulizer tolerance among toddlers with Respiratory distress, University of Auckland, 2023.
20. Al-hajajz et al., Assessment of Mothers' Knowledge and Attitude about Importance of Vit D Supplement for Children in Basra City, International Journal of Applied Sciences and Technology, 2023; 5(4):313-325.
21. Mostafa s et al., Mothers' Knowledge, Attitude, and Practices towards their Children with Cerebral Palsy at Assiut City, Egypt, Assiut Scientific Nursing Journal, 2024;12(45):69-183.
22. Hamad et al., Development a prediction Model of Children Asthma Risk Using Population based Family History Health Record, Pediatric Allergy Immunology, 2023; 34(1):14032