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Assessment of Mothers' Performance Regarding Care of their Children Suffering from Croup

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Abstract
Background: Croup is a common viral respiratory illness seen in the pediatric population. It's a self-limited disease that can be managed easily at home, however the disease can be severe enough to cause a life threatening injury and death.
Aim: This study aimed to assess mothers' performanceregardingcare of their children suffering from croup.
Design: A descriptive research design was utilized in the current study.
Settings: This study was conducted at pediatric emergency, outpatient, and inpatient departments in Mostafa Hassan Hospital affiliated to Fayoum University Hospital, Fayoum General Hospital and Helwan General Hospital affiliated to Ministry of Health.
Sample:A purposive sample of96 mothers and their children.
Tools: Three tools were used for data collection, 1st tool: A structured interview questionnaire to assess mothers knowledge regarding care of their children suffering from croup, 2nd tool: mother reported practices to assess mothers care of their children suffering from croup,and 3rd tool: attitude -type rating scaleto assess mothersattitude regarding care of their children suffering from croup.
Results: Revealed that, the mean age of studiedmothers was 33.57±4.62 years and more than two third of the studied mothers had unsatisfactory knowledge regarding care of their children suffering from croup. Also, more than half of the studied mothers had inadequate practices and had negative attitude regarding care of their children suffering from croup.
Conclusion: Based on results of the present study, it can be concluded that,there were statistically significant relation between the studied mothers total level of knowledge, reported practices and attitude and their characteristics namely; age, educational level and residence with p- value <0.001.
Recommendations: Constantly education altraining program form others to increase their knowledge, practices and attitude regarding care of their children suffering from croup.

Keywords: *Children, Croup, Mothers, Performance.*
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Introduction:
Croup is a common childhood upper respiratory disease accounting for 15% of the annual clinic and emergency department (ED) visits for pediatric respiratory tract infections, it is characterized by abrupt onset of barky cough accompanied by stridor, hoarse voice and respiratory distress, these symptoms result from upper airway inflammation, edema and ultimately obstruction caused by acute respiratory viral infections, most typically para influenza types 1, 2 and 3 **(Choi et al., 2022).**
The disease is frequently appeared in infants and young children in their first four years of life, it is most commonly diagnosed between 6 months and 5 years of age, peaking at 2 years of age, it rarely occurs in newborns and infants < 3 months of age. The disease affects about 3% of children and is 1.4–2 times more prevalent in boys than in girls. Croup is classified as mild, moderate, severe and impending respiratory failure **(Sheikh et al., 2021)**.

A connection between health care providers and the mothers is important to educate mothers and their children about the importance of hygienic care, nutrition, vaccination and healthy housing condition. In addition, the mothers are considered the ones mostly troubled when the children are sick. Therefore, the decision for taking care of the children is generally made by the mothers. However the strategies for prevention of croup and other respiratory tract infections (RTIs) in children are parent education about normal prevalence, familial predisposition, risk factor modification, natural course, specific immunization, chemoprophylaxis and specific and nonspecific immune-stimulant. While vaccines ultimately represent the best opportunity to reduce the morbidity and mortality associated with pediatric respiratory tract infections **(Abdelatty et al., 2022).**

Consequently, treatment of croup depends on the degree of respiratory distress, most children with mild and moderate croup can be treated at home, while the mother provide the full care for her child with regular contact and visits to health care provider office to be aware about the course of the disease and supportive homecare guidelines. However the child need hospitalization if the symptoms not improved with home care or the child suffers impending respiratory failure **(Hockenberry and Wilson., 2018).**

Pediatric nurse has a crucial role to evaluate the mothers' knowledge of their children care to promote their role construction, guidance and support for the implementation of physical health care, guidance for promoting safe environment, development of therapeutic plan, and implementation of child care who is suffering from Croup**(Sizar and Car., 2022).**

Mothers are the main caregivers for their children in almost all societies, hence the knowledge, attitude and health practices of the mothers directly implies on health status and survival of the child. However, a comprehensive health education about etiology, prevention and management has the potential to establish appropriate contact between the health services and societies which increase the capabilities of the mothers to identify the danger signs of such diseases in children and to encourage appropriate early seeking behaviors **(Akteruzzaman et al., 2018).**

Significance of the study:

Children in the early childhood are more vulnerable to upper respiratory tract infections because they have not sufficient resistance immunity system to protect them from outdoor infection and this is the most categories that exposed to infection. According to a report derived from Fayoum General Hospital (Infection Control Office) number of cases that coming to follow up outpatient pediatric clinics was (9730) children under 5 years old who suffered from upper respiratory tract infections since January 2018 to December 2018**(Abdelatty et al., 2022).**

Croup affects about 3% of children per year, typically children between ages 6 months to 6 years **(Sizar& Carr., 2022).**In Egypt, one study conducted in 2016 revealed that, acute respiratory infections are responsible for 39% of outpatient visits at primary health care. The upper respiratory tract infections accounts for 65% from acute respiratory infection, acute croup accounts 6% from upper respiratory infections **(Kela., 2016).** From the researcher point of view the mother care of their children suffering from croup is one of the most important issues that need study and analysis. So, it is important to conduct the current study to highlight onmothers' performance regarding care of their children suffering from Croup.

Operational Definitions:

Mothers' performance means: mothers' knowledge, practices and attitude.

Aim of the study:

The aim of this study was to assess mothers' performance regarding care of their children suffering from croup.

Research questions:

1- What are mothers' knowledge, practices and attitude regarding care of their children suffering from croup?

2- Is there a relation between mothers' characteristics and their performance regarding care of their children suffering from croup?

I. Research Technical design:

1- Research design:

A descriptive research design was used for conducting this study.

2- Research settings:

The study was carried out atthe emergency, outpatient clinics and inpatient departmentsinMostafa Hassan Hospital affiliated toFayoum University Hospital, Fayoum General Hospital and Helwan General Hospital affiliated to Ministry of Health.

3- Research subject:

A purposive sample was used to select 96 mothershave children from 9 months to 6 years and confirmed diagnosis with croup from at least 3 months and free from physical, mental or congenital diseases, attended to the previous mentioned settings during the study period.

Research tools:

Three tools were developed by the researcher to collect the necessary data for this studythrough using the following tools:

Tool (I): Mothers' structured interviewing questionnaire sheet(Appendix I): It was designed by the researcher in the light of content relevant to assess mothers' knowledge about croup. It was in Arabic language and consists of two parts.

Part (I): it was including data about:

A. Characteristics of studied mothers namely age, level of education, number of family members and residence.

B. Characteristics of the studied children namely age, ranking and history of respiratory infections

Part (II): Predesigned questionnaire sheet: This tool was adapted from **Chesney and Duderstadt, (2017) and Hockenberry& Wilson, (2018),** it was used to assess mothers' knowledgeregarding care of their children with croup. It consisted of (32) closed ended questions about components of respiratory system, definition of croup, causes, symptoms, complication and care of children with croup.

Scoring system:

Knowledge of mothers was scored and calculated according to their answers, it was evaluated using the models answers sheet that was prepared by the researcher, each question had a score ranged from 0-2 grades, whereas good answer had score 2 grades, average answer had score 1 grade and score zero for a poor answer. The total score was 64 grades (equal 100%). The total score converted to percentage and then categorized as following if percent score was ≥65% (42: 64 grades) considered satisfactory, while if the percent score < 65% (zero: 41 grades) considered unsatisfactory level of knowledge.

Tool (II): Mothers' reported practices (Appendix II):

Mothers' reported practices, it was adapted from **Wilmott et al., (2018) and Fonceca et al., (2019),** it was used to assess mother's reported practices regarding care of their children with croup. It consisted of 8 checklists namely; care of nebulizer apparatus (8 steps), inhalation drug administration (17 steps), nebulizer inhalation (8 steps), bulb suctioning (9 steps), care of child during fever (9 steps), chest physiotherapy (9 steps), oxygen therapy (14 steps) and mouth care (7 steps).

Scoring system:

Mothers' reported practices regarding croup was scored and calculated according to their answers, each complete and accurate response was scored "one" and those done incorrectly or not done were scored "zero". The total score of mothers' reported practices was 81 scores (equal 100%) and categorized into adequate practice if score ≥ 65% equal (53: 81) grades and inadequate practice if score < 65%) equal (zero: 52) grades.

Tool (III): Mothers' attitude rating scale (Appendix III) .

This scale was designed by the researcher in the lightof related references **Ahmed, (2008)**to assess the attitude of the mothers towardcroup.It included 19 statements.

Scoring system:

Mothers' responses were classified as " agree", "not sure " and "disagree" and respectively scored 2, 1 and zero.The scoring of the items summed up and converted into a percentage scores. Then all data classified into 2 categories included;positive attitude if score ≥ 65% equal (25: ≥ 38) grades and negative attitude if score< 65% equal (zero:< 24) grades.

II. Operational Design:

The operational design includes preparatory phase,content validity, pilot study and fieldwork.

1. The Preparatory Phase

It included reviewing of related literature using textbooks, journals, scientific periodicals and web-sites wasconducted to develop the study tools and to get acquaintedwith the various aspects of the research problem.

2. Pilot Study:

A Pilot study involved ten mothers and their children (10% of the total sample size) to test feasibility and applicability of the tools and to assess the time required to fulfill the tools. The result of the data obtained from the pilot study helped in modification of the study tools, where some items were corrected, omitted and added as necessary. Subjects included in the pilot study were excluded later from the study sample.

3. Content Validity and reliability:

The tools were revised by a jury of three experts (assistant professors) of the pediatric nursingstaff at the Faculty of Nursing, Helwan University and Fayoum university. The jury reviewed the tools for its validity, comprehensiveness,accuracy, clarity and relevance. The internal consistency ofthe developed tools was tested for their reliability usingCranach's alpha coefficient test by a statistician to assessreliability of the tools; the tool(I) were reliable atr = 0.845, tool(II) was reliable at r = 0.896 and tool (III) was reliable at r =0.873

4. Field work

After gaining the research committee acceptance and official permission of directors of study settings, the researcher introduced himself to the mothers to explain the purpose of the study. The researcher was available in each study settings during the morning shifts twice weekly over a period of six months from December 2022 to May 2023 to gather the data using the previously mentioned tools.

The researcher met the mothers at emergency, outpatient, inpatient departments to collect data about the children and their care. The components of the tools assured data collected would be confidential and would be only used to achieve the purpose of the study.

The data was collected using the previous mentioned tools, observation, and the mothers. Through the following phases; The researcher stating the interviewing process by filling personal data of the mothers and children which take about 5 minutes, then data about knowledge, reported practices, and attitude of mothers regarding their children care which take about 15 minutes.

III. Administrative Design:

An official letter requesting permission to conduct thestudy was submitted from the Dean of Faculty of Nursing- Fayoum Universityto the director of previously mentioned studysetting to collect the necessary data for the current study. Theletter included the aim of the study in order to get permissionand help for collection of data. The necessary approval wasobtained from the units' directors.

Ethical considerations:

An official permission to conduct the proposed study was obtained from The Scientific Research Ethics Committee, Faculty of Nursing,Helwan University. Participation in the study was voluntary and subjects were given complete full information about the study and their role before signing the informed consent and that they had the right to refuse to participate. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs was respected.

IV. Statistical Design:

Data were revised, coded and analyzed by usingcomputer program (SPSS) version 20. Data were presentedusing descriptive statistics in the

form of numbers andpercentage, Means and Standard Deviation (±SD): chisquare test.All tests were performed at the level of significance as P-value ≤ 0.05 was considered statistically significant, P-value < 0.01 was considered statistically highlysignificant, and P-value > 0.05 was considered statistically insignificant.

Results

Table (1): Percentage distribution of the studied mothers according to their characteristics**(n=96):**

Mothers'characteristics	No	%
Age in (years)		
- <20	10	10.4
- 20- <30	68	**70.8**
- 30- <40	14	14.6
- ≥40	4	4.2
Mean ± SD	**33.57±4.62**	
Educational level		
Illiterate	45	**46.9**
Read and write	20	20.8
Intermediate education	16	16.7
University education	15	15.6
Residence		
Rural	64	**66.7**
Urban	32	33.3
Numbers of children		
Less than three	15	15.6
From three to five	70	**72.9**
More than five	11	11.5
Accommodation rooms		
Two Rooms	11	11.5
Three rooms	58	**60.4**
Four rooms	18	18.8
More than four rooms	9	9.3
Room window		
Yes	80	**83.3**
No	16	16.7

Table (1)showsthat, **70.8%** of the studied mothers were in the age group of 20- <30 with (Mean ± SD **33.57±4.62).** Concerning educational level and residence, it was cleared that,**46.9**% of them their educational level were illiterate and **66.7%** living in rural. On the other hand, **72.9%**ofthemhad number of children from three to five, while, **60.4%** of them had three rooms and **83.3%** had window in every room.

Table (2): Percentage distribution of the studied children according to their characteristics **(n=96):**

Child'scharacteristics	No.	%
Age (years)		
<1	23	24.0
1- 3	57	**59.3**
4- 6	16	16.7
Mean ±SD	**2.56±1.83**	

Ranking		
First	38	**39.6**
Second	35	36.4
Third	23	24
History of respiratory diseases		
Yes	34	35.4
No	62	**64.6**

Table (2)reveals that, mean age of the studied children was **2.56±1.83** years, and**39.6%** of them ranked as first child. Related tohistory of respiratory diseases, **64.6%** of studied children had no history of respiratory disease.

Figure(1): Percentage distributionofthestudiedmotherstotallevelofknowledgeregardingcare of their children suffering from croup **(n=96):**

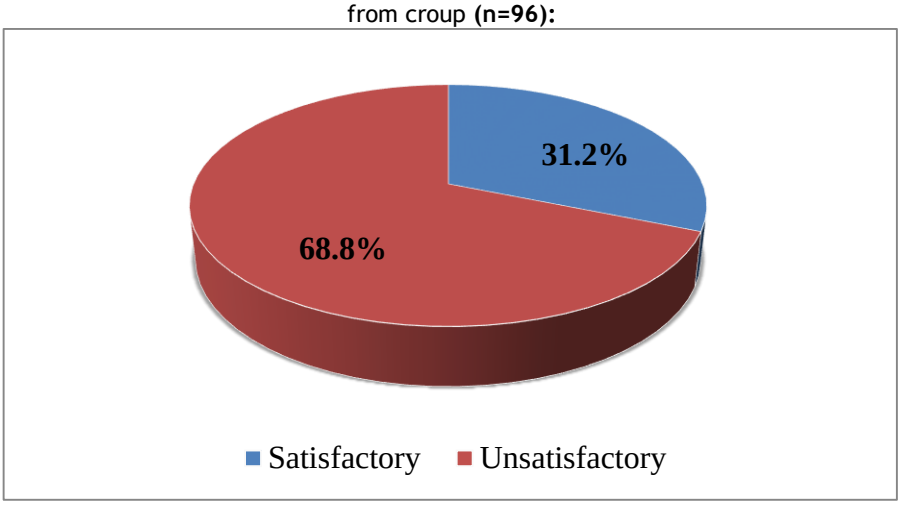
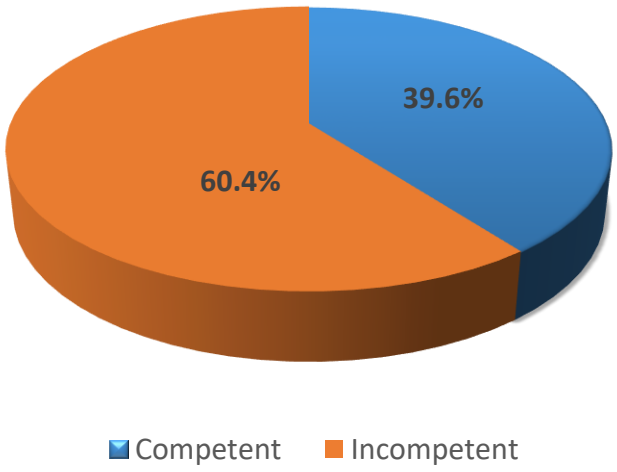


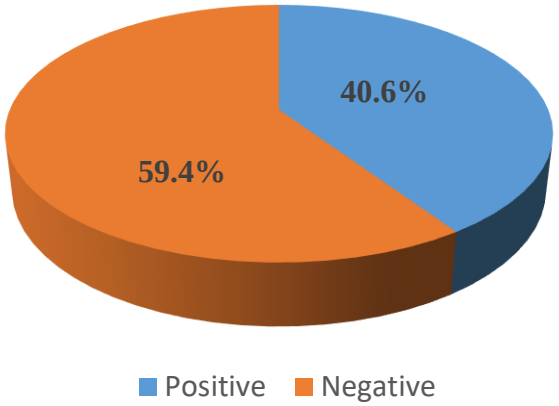
Figure (1) clarifies that, more than two thirds**(68.8%)** ofthe studied mothers had unsatisfactory level of total knowledge regarding care oftheir children suffering from croup.

Figure(2): Percentage distribution of the studied motherstotallevel of reported practices regardingcare of their children suffering from croup **(n=96):**



As regards the total level of reported practices of the studied mothers, **figure (2)** reveals that, **60.4%** ofthem had inadequate practices regardingcare of their children suffering from croup.

Figure(3): Percentage distribution of the studied motherstotal attitude regarding care of their children suffering from croup **(n=96):**



As regards the studied mothers' total attitude **Figure (3)** illustrates that,more than half **(59.4%)** of studied mothers had negative attitude regarding care of their children suffering from croup.

Table(3): Relation between the studied mothers total knowledge and their characteristics**(n=96):**

	Total knowledge					
	Satisfactory		Unsatisfactory		Chi-square	
	N	%	N	%	X^2	P-value
Age (years)						
<20	2	20.0%	8	80.0%	19.175	<0.001*
20- <30	15	22.1%	53	77.9%		
30- <40	9	64.3%	5	35.7%		
≥ 40	4	100.0%	0	0.0%		
Job						
Work	8	32.0%	17	68.0%	0.009	0.925
Not work	22	31.0%	49	69.0%		
Educational level						
illiterate	3	6.7%	42	93.3%	39.118	<0.001*
Read and write	5	25.0%	15	75.0%		
Intermediate education	9	56.3%	7	43.8%		
University education	13	86.7%	2	13.3%		
Family members						
Less than three	7	46.7%	8	53.3%	4.174	0.124
From three to five	22	31.4%	48	68.6%		
more than five	1	9.1%	10	90.9%		
Accommodation rooms						
Two Rooms	2	18.2%	9	81.8%	2.676	0.444
Three rooms	18	31.0%	40	69.0%		
four rooms	8	44.4%	10	55.6%		
more than four rooms	2	22.2%	7	77.8%		
Room window						
Yes	26	32.5%	54	67.5%	0.349	0.555

No	4	25.0%	12	75.0%		
Residence						
Urban	24	75.0%	8	25.0%	42.764	<0.001*
rural	6	9.4%	58	90.6%		

**:SignificantatP≤0.05* **: Highly Significant at P ≤ 0.001*

Table(3) illustrates that, there werea highly statistically significant differencebetween the studied mothers total level of knowledge and their characteristics namely; age, educational level and residence with p-value <0.001*.

Table(4): Relation between the studied mothers total practices and their characteristics**(n=96):**

	Total practice					
	Competent		Incompetent		Chi-square	
	N	%	N	%	X^2	P-value
Age (years)						
<20	6	60.0%	4	40.0%	15.274	0.002*
20- <30	19	27.9%	49	72.1%		
30- <40	9	64.3%	5	35.7%		
≥40	4	100.0%	0	0.0%		
Job						
Work	12	48.0%	13	52.0%	1.001	0.317
Not work	26	36.6%	45	63.4%		
Educational level						
illiterate	5	11.1%	40	88.9%	35.095	<0.001*
Read and write	9	45.0%	11	55.0%		
Intermediate education	11	68.8%	5	31.3%		
University education	13	86.7%	2	13.3%		
Family members						
Less than three	9	60.0%	6	40.0%	4.751	0.093
From three to five	27	38.6%	43	61.4%		
more than five	2	18.2%	9	81.8%		
Accommodation rooms						
Two Rooms	3	27.3%	8	72.7%	2.502	0.475
Three rooms	26	44.8%	32	55.2%		
four rooms	5	27.8%	13	72.2%		
more than four rooms	4	44.4%	5	55.6%		
Room window						
Yes	34	42.5%	46	57.5%	1.707	0.191
No	4	25.0%	12	75.0%		
Residence						
Urban	24	75.0%	8	25.0%	25.176	<0.001*
rural	14	21.9%	50	78.1%		

**:SignificantatP≤0.05* **: Highly Significant at P ≤ 0.001*

Table (4)reveals that, there were highly statistically significant differencebetween total mothers reported practices and their characteristics namely; age, educational level and residence with p-value <0.001*.

Table(5): Relation between the studied mothers total attitude and their characteristics**(n=96):**

	Total attitude					
	Positive		Negative		Chi-square	
	N	%	N	%	X^2	P-value
Age (years)						

<20	6	60.0%	4	40.0%	12.568	0.006*
20- <30	20	29.4%	48	70.6%		
30- <40	10	71.4%	4	28.6%		
≥40	3	75.0%	1	25.0%		
Job						
Work	14	56.0%	11	44.0%	3.313	0.069
Not work	25	35.2%	46	64.8%		
Educational level						
illiterate	5	11.1%	40	88.9%	41.368	<0.001*
Read and write	8	40.0%	12	60.0%		
Intermediate education	12	75.0%	4	25.0%		
University education	14	93.3%	1	6.7%		
Family members						
Less than three	9	60.0%	6	40.0%	4.643	0.098
From three to five	28	40.0%	42	60.0%		
more than five	2	18.2%	9	81.8%		
Accommodation rooms						
Two Rooms	3	27.3%	8	72.7%	1.268	0.737
Three rooms	25	43.1%	33	56.9%		
four rooms	8	44.4%	10	55.6%		
more than four rooms	3	33.3%	6	66.7%		
Room window						
Yes	35	43.8%	45	56.3%	1.943	0.163
No	4	25.0%	12	75.0%		
Residence						
Urban	24	75.0%	8	25.0%	23.514	<0.001*
rural	15	23.4%	49	76.6%		

**:SignificantatP≤0.05* **: Highly Significant at P ≤ 0.001*

Table (5) shows that, there were highly statistically significant differencebetween total mothers attitude and their characteristics namely; age, educational level and residence with p-value <0.001*.

Table (6): Correlation between total mothers knowledge, practices and attitude regardingcare of their children suffering from croup**(n=96):**

		Total knowledge score	**Total attitude score**
Total attitude score	r	0.913	
	P-value	<0.001*	
Total practice score	r	0.827	0.776
	P-value	<0.001*	<0.001*

Table(6)revealsthat there were statistically significant relation between the studied mothers total level of knowledge, reported practices and attitude regardingcare of their children suffering from croup with p-value <0.001*.

Discussion:

Croup is a common upper respiratory disease in childhood. Although croup is a self-limited disease that can be managed easily at home, the disease can be severe enough to cause a life threatening injury and rapid deterioration which lead to death if not managed appropriately. So that, mothers should be aware about danger signs and symptoms of croup and the proper management of the disease for maintaining health for their children and prevent its complications **(Park et al., 2022).** Meanwhile the current study was aimed to assess mothers' performance regarding care of their children suffering from croup.

The characteristics of the studied mothers **(Table,1)** were consistent with **Ahmed., (2016)** who studied "Stressors and coping patterns of mothers having children with bronchial asthma"**, Attia et al., (2020)** who studied "Compliance of Egyptian mothers to asthma controllers"**, Abdul-Kareem et al., (2021)** who studied "Mother's practice of knowledge concerning their children under five years with upper respiratory tract infection", **Tawfique et al., (2021)** who studied "Mothers' knowledge and reported practices about corona virus disease -19 (COVID-19) among their children with diabetes mellitus", **Shaker et al., (2021)** who studied"Mothers' knowledge and reported practice regarding inhalation therapy for their children suffering from croup" and **Al Noban and Elnimeiri., (2022)** who studied "Mothers knowledge, attitude and practices regarding acute respiratory infection in children under five years/ urban and rural areas".

But on contrary with **Hiremath and Desai et al., (2020)** who studied "A study to assess the knowledge of mothers of infants regarding aspiration pneumonia in selected pediatric hospital at bangalore with a view to develop an Information booklet"**, Amuka et al., (2020)** who studied "Knowledge, perceptions and practices of caregivers on pneumonia among children aged below 5 Years in Migori county Referral hospital, Kenya", **Scott and Lee., (2021)** who studied "Developing and testing an art-based, digital knowledge translation tool for parents about childhood croup",**Albayrak et al., (2021)** who studied "Evaluation of parental knowledge, attitudes and practices regarding antibiotic use in acute upper respiratory infections in children under 18 years of age: a cross-sectional study in turkey",**Filemban et al., (2022)** who studied "Knowledge and attitude of children safety at home among population in Saudi Arabia",and**Ashena et al., (2022)** who studied "Mothers' knowledge, attitude, and practice on antibiotic use for upper respiratory tract infections in children; an experience from Iran".

The characteristics of the studied children **(Table, 2)**were consistent with **Chellappan., (2016)** who studied "Knowledge, attitude and practice of mothers of under five children regarding immunization"**,Joshy et al., (2018)** who conducted a study entitled "Effectiveness of information booklet of knowledge of mothers regarding home management of respiratory tract infection among under five children in Pallithottam at Kollam"**, Scott and Lee., (2021)** who studied "Developing and testing an art-based, digital knowledge translation tool for parents about childhood croup", **El attar et al., (2022)** who studied "Mothers' knowledge, practice and attitude regarding warts in children"**, Pierantoni et al., (2022)** who studied "Multicentre study revealed significant gaps between evidence-based recommendations for using corticosteroids for croup and clinical practice"**,** and**Hayeset al., (2022)** who conducted a study entitled "Croup associated with COVID-19: A case series".

Concerning studied mothers total level of knowledge regarding care of their children suffering from croup **(Figure, 1)** the current study revealed that, more than two thirds of the studied mothers had unsatisfactory level of knowledge regarding care of their children suffering from croup. These findingswere inthe same line with**Shaker et al., (2021)** who studied"Mothers' knowledge and reported practice regarding inhalation therapy for their children suffering from croup", and found that, more than half of the studied mothers had unsatisfactory level of knowledge. These findings were in disagreement with **Bhalla et al., (2019)** who studied "Parental knowledge and common practices regarding acute respiratory infections in children admitted in a hospital in rural setting", and found that, the knowledge of parents was satisfactory.

From the researcher point of view, these results may be due to that many of the studied mothers were from rural and obtained their knowledge about croup from friends and relatives. Also these results confirmed the need for mother's education programs to increase their knowledge regarding care of their children suffering from croup.

Concerning mother's total level of reported practices regarding care of their children suffering from croup **(Figure, 2)** the current study revealed that, more than half of studied mothers had incompetent practices regarding care of their children suffering from croup. These findings were in an agreement with a study done by **Hassan et al., (2018)** who studied "Parents' care about pneumonia among preschool children", and found that, more than half of the studied parents had unsatisfactory level of practice regarding care of children with pneumonia. These findings were in disagreement with **Gamtessa and seid., (2021)** who studied "The knowledge and practice of mothers caring for their children with acute respiratory infection among those attending the under-five unit at Beadle hospital, southwest Ethiopia, and found that, more than half of the studied mothers had competent level of practice regarding acute respiratory tract infectionin their children.

From the researcher point of view, this result may be due to the low educational level of the studied mothers which reflected on their performance to provide care for their children.

Concerning mother's total attitude regarding care of their children suffering from croup **(Figure, 3)** the current study showed that, more than half of studied mothers had negative attitude regarding care of their children suffering from croup. These findings were in an agreement with **Alluqmani., (2017)** who studied "Knowledge, attitude and practice of mothers on acute respiratory infection in children under five years in Saudi Arabia", and found that, more than half of the studied mothers had negative attitude. The findings were in a disagreement with **Lakshmi et al., (2021)**, who studied "Assessing the knowledge, attitude and, practice on antibiotic use in under five children with respiratory tract infection among mothers attending a pediatric outpatient department", and found that, more than three quarters of the studied mothers had positive attitude.

From the researcher point of view, this result may be due to lack of educational programs about croup and the spread of wrong beliefs, customs and traditions in rural.

As regards relationsbetweenthestudiedmothers' characteristicsand their total knowledgeregardingcare of their children suffering from croup **(Table, 3)**. the findings of the current study represented that, there were a highly statistically significant difference between the studied mothers' characteristics namely age, educational level

and residence and their total level of knowledge with p-value <0.001*. These findings agreed with **Hassona et al., (2021)** who studied "Knowledge, attitude and practices of mothers towards fever and its home management among under five children in Kom Hamada city, Behira government, Egypt", and **Bassam., (2022)** who studied "Evaluate maternal knowledge and attitude regarding first aid among their children in Buraidah city, Saudi Arabia Kingdom (KSA) ", and found that, there were statistically significant difference between mothers' characteristics namely age, educational level and residence and their total knowledge.

From researcher point of view, this result may be due to higher illiteracy rate in rural area. So the studied mothers had insufficient knowledge regarding their children care.

Concerning relations between the studied mothers' characteristics and their total reported practices regarding care of their children suffering from croup **(Table, 4)**. The findings of the current study represented that, there were highly statistically significant differencebetween total mothers' characteristics namely age, educational level and residence and their total reported practices with p-value <0.001*. These findings agreed with **Srinivasan., (2022**) who studied "Knowledge and practices of mothers towards oral health of their 3-5 years children a rural and urban comparative study", and**Memon et al., (2019**) who studied "Knowledge, attitude and practice among mothers about new born care in Sindh, Pakistan", and found that, there were statistically significant difference between mothers' characteristics namely educational level and residence and their total practice.

From researcher point of view, this result may be due to higher illiteracy rate in rural area and many of studied mothers still in middle age. So the studied mothers had insufficient experience and practices to deal with their children during illness.

In assessing the relation between the studied mother's characteristics and their total attitude regarding care of their children suffering from croup **(Table, 5)**. The findings of thepresent study clarified that, there were a highly statistically significant difference between total mothers' attitude and their age, educational level and residence with p-value <0.001*. These findings agreed with **Memon et al., (2019)** who studied "Knowledge, attitude and practice among mothers about new born care in Sindh, Pakistan", and found that, there were statistically significant difference between mothers' characteristics namely age, educational level and residence and their total attitude.

From researcher point of view, this result may be due to higher illiteracy rate in rural area and many of studied mothers were newly mothers.

Concerning the correlation between total mothers' knowledge, reported practices and attitude regarding care of their children suffering from croup **(Table, 6)**. The current study findings revealed that, there was a positive correlationamong all study variables. These findings agreed with **Al-Ali et al., (2022)** who studied "Parental knowledge, attitudes, and practices regarding the use of prescribed inhalers in asthmatic children attending ambulatory healthcare services clinics", **El attar et al., (2022)** who studied "Mothers' knowledge, practice and attitude regarding warts in children", and**Elslemy et al., (2023)** who studied "Effect of implementing educational intervention on mothers' knowledge and practices regarding respiratory problems for children with cerebral palsy", found that, there were positive correlation between knowledge, practice and attitude of the studied mothers.

From researcher point of view, this result may be due to the poor knowledge of the studied mothers which reflected on their practices and attitude.

Conclusion:

Based on the study finding, it can be concluded that, more than two thirds ofthe studied mothers had unsatisfactory level of knowledge regarding care of their children suffering from croup.In addition, more than half of them had inadequate practices and negative attitude regardingcare of their children suffering from croup. Finally, there were statistically significant relation between the studied motherstotal level of knowledge, reported practices and attitude and their characteristics namely; age, educational level and residence with p- value <0.001.

Recommendations

Based upon the results of the current study the following recommendations are suggested:

- Designing educational training program for mothers to increase their knowledge, practice and attitude regarding care of their children suffering from croup.
- Distribution of guidelines booklets for mothers about croup in pediatric care settings.
- Replication of this study on a larger sample from the different geographical locations at the Arab Republic of Egypt and further research.

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