

Mothers' Knowledge and Practices Regarding Care of their Children with Respiratory Syncytial Virus

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Abstract

Background: Respiratory syncytial virus is the chief cause of lower respiratory tract infections in children which causes mild to severe symptoms. **Aim:** To assess mothers' knowledge and practices regarding care of their children with Respiratory Syncytial Virus. **Subjects and Method: Research design:** A descriptive research design was utilized. **Setting:** The research was conducted at pediatric out-patient clinic for respiratory diseases at Minia university hospital for obstetrics and pediatrics **Subjects:** A purposive sample of 322 mothers and their children under five years with acute respiratory tract infections. **Tools: Tool (I):** Respiratory syncytial virus knowledge questionnaire covering the demographic characteristics of the studied mothers and their knowledge regarding Respiratory Syncytial Virus. **Tool (II):** Mothers reported practices regarding care of children with RSV **Results:** The majority of mothers had unsatisfactory level of knowledge and unsatisfactory level of reported practices regarding Respiratory Syncytial Virus. Additionally, there was a statistically significant relation between mother's personal as well as social data and their total knowledge and reported practices concerning Respiratory Syncytial Virus. Also, there was a statistically significant strong positive correlation between mother's total knowledge and total reported practices. **Conclusion:** The mothers had unsatisfactory level of knowledge and reported practices regarding care of their children with Respiratory Syncytial Virus. **Recommendations:** Educational program for mothers could be conducted to raise their knowledge and to improve their practices regarding care of children with Respiratory Syncytial Virus.

Keywords: Children, Mothers' Knowledge, Practices, Respiratory Syncytial Virus.

Introduction

Respiratory Syncytial Virus (RSV) is a usual respiratory virus that causes mild, cold-like symptoms in older as well as adults' healthy kids. Nevertheless, in infants and young children it can be serious, particularly children under five years old ⁽¹⁾. In addition to a range of symptoms from mild to severe, RSV can occasionally result in life-threatening side effects like pneumonia or bronchiolitis.

Testing is typically not necessary to diagnose RSV because the infection can present with mild symptoms that resemble the common cold. Nonetheless, a doctor may suspect RSV based on a patient's medical history, the season, and a physical examination ⁽²⁾. A persistent cough is one of the most typical signs of RSV in children younger than five years old. Breathing difficulties and wheezing are frequently present with this cough.

Children with RSV-associated bronchiolitis frequently presented with a cough lasting longer than ten days, according to a study by **Mansbach et al. (2021)**⁽³⁾, children who have a severe RSV infection may also exhibit rapid breathing, chest retractions and nasal flaring.

Respiratory Syncytial Virus (RSV) is a major reason of respiratory infections that require hospitalization for children, however the majority of Lower Respiratory Tract Infections (LRTIs) are mild⁽⁴⁾. There are currently no preventive or etiologic therapies available for RSV. Supportive care, which includes managing volume depletion and providing respiratory support, is the sole available therapeutic option⁽⁵⁾.

In addition, monoclonal antibodies (MAb) are the only available preventive intervention and RSV vaccines are not available commercially⁽⁶⁾. Moreover, Their use is compelled to be restricted to specific risky cohorts (prematurely born infants below six months of age, children younger than two years old who have certain comorbidities during the RSV season^(7,8)).

As Prevention is a key aspect of management for RSV among children under five years, nurses play a vital role in assessing mother's awareness regarding RSV so educating parents and caregivers regarding RSV can be enhanced. They can offer guidance on using hand sanitizers and washing hands properly. Additionally, since the RSV vaccine has been demonstrated to lessen the severity of the infection, nurses should encourage the administration of the vaccine to eligible children⁽⁹⁾. Many mothers were not aware of the recommended treatment options for RSV, including the use of antiviral

medications and the significance of supportive care measures like rest and hydration, according to a study by **Johnson et al. (2022)**⁽¹⁰⁾. This ignorance may lead to treatment decisions that are not ideal and may even make the child's condition worse.

Significance of the research

Respiratory Syncytial Virus (RSV) is the primary reason of acute respiratory infections (ARIs) in children under the age of five. It is estimated to cost the United States (US) economy \$400 million a year and result in 57 000 hospital admissions. The great majority of RSV-related medical visits occur in an outpatient setting; however, one-half million outpatient visits are thought to be related to RSV infections in children with young age. Furthermore, the true prevalence of RSV cases linked to visit of emergency department (ED) is underrecognized because the routine clinical RSV testing is either infrequent or inconsistent. This could be attributed to variations in laboratory resources across settings and regions, as well as a lack of data from non-pediatric hospitals as well as children older than infancy⁽¹¹⁾.

In Egypt, a resurgence of RSV and influenza was noted during the winter of 2022–2023. Compared to influenza, RSV caused more severe symptoms, but influenza caused a higher infection rate. In several Egyptian governorates, elementary and preparatory school students had high rates of absenteeism coupled with ARI symptoms in October 2022, according to data from the Egypt Broad Caste System (EBS). Furthermore, an increase in the spread of RSV and influenza among inpatients and outpatients was found by the ARI surveillance (unpublished data).

The Ministry of Health and Population (MOHP) announced in late November 2022 that the rate of RSV had increased to 70% compared to 15 % in 2020–2021 ⁽¹²⁾.

Aims of the study

To assess mothers' knowledge and reported practices regarding care of their children with RSV.

Questions of the Research:

- 1- What is the mothers' level of knowledge regarding RSV?
- 2- What are the mothers' reported practices regarding care of their children with RSV?

Subjects and Method

Study design:

A descriptive research design was used to conduct this research.

Setting:

The research was conducted at the pediatric out-patient clinic for respiratory diseases at Minia university hospital for obstetrics and pediatrics (MUHOP) which covers Minia governorate.

Subjects:

A purposive sample of 322 mothers and their children with ARIs below five years was approached. According to MUHOP census, the yearly average of children with ARIs attending pediatric out-patient clinic for respiratory diseases was 1950 case. Considering an estimated prevalence of 70 % of RSV in Egypt in 2021 ⁽¹²⁾, the Epi info 7 program was used to calculate the sample size; based on the following: 1950 is the population size, 5 percent is the acceptance error, 95 percent is the confidence coefficient, and 50 percent is the response distribution.

Inclusion criteria:

Mothers of children below five years with ARIs regardless of their sex.

Exclusion criteria

Mothers of children with ARIs accompanied with congenital heart defects or any chronic diseases.

Tools of data collection:

Tool (I): Respiratory syncytial virus knowledge questionnaire. This tool was designed by researchers depending on reviewing the following related literatures (**Abdul-Kareem et al., 2021 & Abdelatty et al., 2022**) ^(13,14). It included the following parts:

Part I: Socio-demographic data of the mothers:-

It involved age, residence, type and size of family, occupation, and level of education.

Part II: Child bio-sociodemographic characteristics:

It included child data such as: age, gender, weight, type of feeding, duration of breast or artificial feeding, age of weaning, received vaccination, history of respiratory tract infection and number of hospital admission due to that cause.

Part III: Mother's knowledge about RSV:

It assessed the mother's knowledge about RSV including: definition (5 answers), high risk groups (7 answers), time of seasonal spread (5 answers), onset of the disease (3 answers), modes of transmission (6 answers), risk factors (10 answers), incubation period (5 answers), signs and symptoms (21 answers), communicability period (3 answers), complications (5 answers), treatment (11 answers), home management (8 answers) and prevention measures (11 answers).

Tool (II): Mothers reported practices regarding care of children with RSV:

This part included the following: first action taken on the onset of the disease (6 answers), practices regarding fever (8

answers) , practices regarding cough (8 answers), measures regarding dyspnea (5 answers) and position during using nebulizer (4 answers).

Scoring system:

The knowledge section of the questionnaire was scored on a point system, where one point was awarded for a correct response and zero for an incorrect response or a lack of knowledge. So, the mothers were indicated have a satisfactory (high) knowledge level if the score $\geq 60\%$ (9/16), and unsatisfactory (low) level if the total score $< 60\%$ ($< 9/16$).

The scoring system to evaluate the mothers' reported practices related their child infection were calculated based on one point (1) for the correct practice as well as zero (0) for the wrong practice. So, the mothers were indicated have a satisfactory (high) practices level if the score $\geq 60\%$ (6/10), and unsatisfactory (low) if the total score $< 60\%$ ($< 6/10$).

Validity and Reliability:

Five professionals in pediatric nursing as well as community health evaluated the study tools' content validity. The study materials were written in Arabic to accommodate the comprehension levels of all mothers. The tools' content coverage, item order, clarity, applicability, relevance, word length, format, and overall appearance were all evaluated. Changes were implemented in response to suggestions and remarks from experts. Using Cronbach's alpha, the study questionnaire's reliability was determined. Data analysis revealed that the reported practice assessment part's coefficient alpha was 0.89 while the knowledge part was 0.90.

Data collection procedure:

To get his cooperation, the director of the MUHOP had provided an approval letter to conduct the study. Four months passed between the beginning of December 2022 and the end of March 2023 during which data were gathered. Three days a week, on Sunday, Tuesday, and Thursday, researchers worked the morning shift in the study setting for three hours, from 9 a.m. to 12 p.m., in order to collect data. The researchers selected this time because it coincides with a high volume of mothers visiting the clinics. Every day, on average, five to seven mothers were interviewed. Before the doctor examined the child, the researchers introduced themselves to the mothers in the waiting area to begin the interview. After that, they explained the study's purpose to the mothers in order to get their approval and verbal consent. The study questionnaire was used to conduct individual interviews with each mother. The study questionnaire for mothers who could not read or write was filled out by the researcher. The study questionnaire took between 15 and 25 minutes to complete.

Pilot study:

Ten percent (32) of subjects participated in a pilot study. It was carried out to gauge how applicable and clear the tools of the study, as well as to determine how long it would take to complete them. Based on the findings of the pilot study; no modifications were done to the questionnaire. As a result, the pilot study sample was part of the overall study sample.

Ethical considerations:

Informed oral consent was obtained from all mothers prior to participation in order to gain their cooperation; this consent included information about the purpose of the work, study design, site, time, subject, and study tools. An ethical approval with a code number of REC2023102 was obtained from the ethics and research committee at Minia University before the study began. Every evaluation form was coded to ensure confidentiality and privacy. The freedom to leave the study at any moment and the participants' voluntary participation were guaranteed.

Statistical analysis:

For qualitative variables, data tabulation is done using descriptive statistics represented as frequencies as well as percentages, and for quantitative variables, as means as well as standard deviations. Moreover, Chi-square is employed in relationship assessments. At p-value <0.05, statistical significance was deemed to have occurred. The statistical software program SPSS 24.0 will be used for data entry and statistical analysis.

Results

Table (1): presents that half of mothers (50%) are aged less than 30 years with mean age 28.4242 ± 7.034 yrs., while (69.6%) of them live in rural areas, in addition (68.3%) of them live within extended families. Regarding the number of family members, (61.5%) of mothers have more than five members per family, also (67.7%) of them are housewife while (44.4%) of them do not read or write.

Table (2): shows that 53.4% of children are aged less than one year with mean 1.4321 ± 0.014 yrs., also 65.2% of them are males, 46.6% are less than ten kilogram in

the weight. Regarding the type of feeding 56.5% of children feed with the two methods "breast feeding and artificial feeding. Concerning the vaccination, 80.1% received their vaccines on time. The same table shows that 79.2% of the children previously infected with respiratory infections while 56% of them are infected twice, also the interval between the first and the second episode of respiratory infection was less than one month among 40.7% of the children who are previously infected, moreover 47.8% of them received their treatment at home, and 52.2% of mothers did not give the child any medications without a medical examination.

Figure (1): shows that (69.6%) of the mothers have unsatisfactory level of knowledge about RSV, while (30.4%) of them have a satisfactory level knowledge about RSV.

Figure (2): mentions that (60.6%) of the mothers have unsatisfactory level of reported practices toward RSV, while (39.4%) of them have satisfactory level of reported practices toward RSV.

Table (3): shows that there are statistical significant differences between all items of mother's personal as well as social data and their total knowledge about RSV ($P=0.001$).

Table (4): reveals that there are statistically significant differences between all items of mother's personal as well as social data and their total reported practice toward RSV ($P=0.001$).

Table (5): illustrates that there is a positive significant correlation between the mother's total knowledge and total reported practice regarding RSV while $r=0.820^{**}$ $P=0.001$, also there is a positive significant correlation between the child's

history of respiratory infection and the mother's total knowledge as well as reported practices regarding RSV while $r=0.269^{**}$ & 0.210^{**} $p=0.001$ respectively.

Table (1): Percentage distribution of the mother's socio-demographic data (n=322)

Items	Mothers (n= 322)	
	No.	%
Mother's age		
<30	161	50.0
30-40	98	30.4
>40	63	19.6
Mean \pmSD	28.4242 \pm 7.034	
Residence		
Rural	224	69.6
Urban	98	30.4
Type Family		
Independent	102	31.7
Extended	220	68.3
Number of family members		
3	65	20.2
4	59	18.3
≥ 5	198	61.5
Number of rooms in the house		
1	0	0
2	49	15.2
3	103	32.0
>4	170	52.8
Mother's work		
Housewife	218	67.7
Employee	104	32.3
Mother's educational level		
Do not read or write	143	44.4
Basic education	81	25.2
Diploma/secondary school	33	10.2
University or post graduated	65	20.2

Table (2): Percentage distribution of the child's bio-socio-demographic data (n=322)

Child characteristics	No	%
Child's age		
<1	172	53.4
1-<3	107	33.2
3-<5	43	13.4
Mean \pmSD	1.4321 \pm 0.014	
Child gender		
Male	210	65.2
Female	112	34.8
Current weight		
<10	150	46.6
10-15	112	34.8
>15	60	18.6
Mean \pmSD	12.4146 \pm 4.017	
Type of feeding		
Breastfeeding	75	23.3
Artificial feeding	65	20.2
Both	182	56.5
Regularity of taking vaccination		
Take vaccinations on time	258	80.1
Delay in taking vaccinations due to illness	64	19.9
Has the child had respiratory infections before?		
Yes	255	79.2
No	67	20.8
If yes: Frequency of infection? (no=255)		
Once	17	6.7
Twice	143	56
Three times or more	95	37.3
The interval between the first and the second infection?		
<1 Month	104	40.7
1-3month	95	37.3
>3month	56	22
Where was the child treated previously?		
At home	122	47.8
In the hospital	112	44
In a private clinic	21	8.2
Did you give the child any medications without a medical examination?		
Yes	122	47.8
No	133	52.2

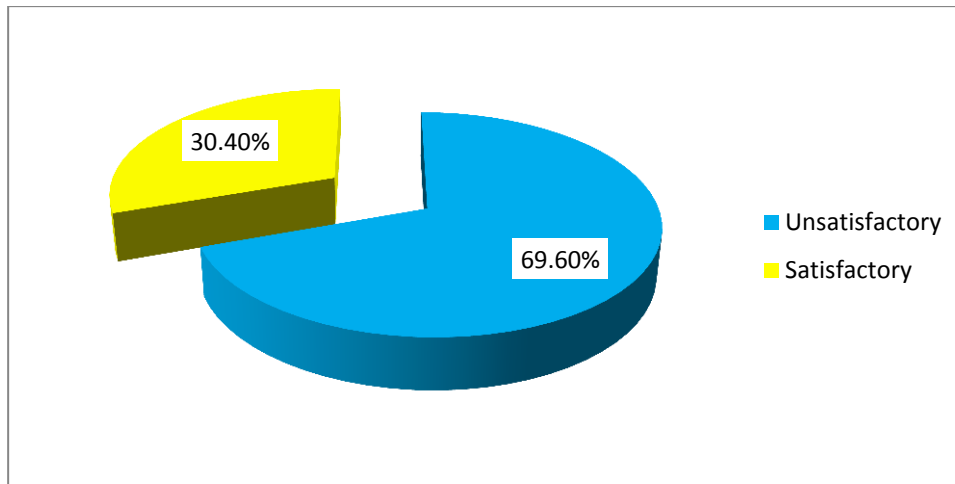


Figure (1): Percentage distribution of the mother's total knowledge about RSV (n=322)

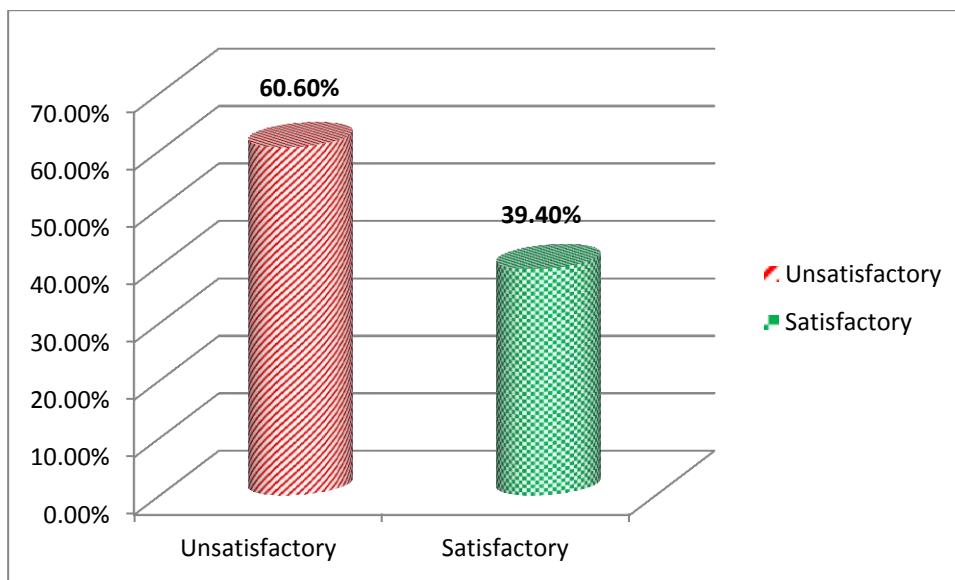


Figure (2): Percentage distribution of the mother's total reported practices about RSV (n=322)

Table (3): Relation between mother's total knowledge about RSV and their personal as well as social data (n=322)

Items	Unsatisfactory (n=224)		Satisfactory (n=98)		Fisher – exact(P- value)
	No.	%	No.	%	
Mother's age					
•<30	161	100	0	0	381.073 0.001**
•30-40	0	0	98	100	
•>40	63	100	0	0	
Residence					
– Rural	224	100	0	0	322.00 0.001**
– Urban	0	0	98	100	
Type Family					
– Independent	4	3.9	98	96.1	303.8 0.001**
– Extended	220	100	0	0	
Number of family members					
– 3	0	0	65	100	304.9 0.001**
– 4	26	44.1	33	55.9	
– ≥5	198	100	0	0	
Number of rooms in the house					
– 1	0	0	49	100	243.7 0.001**
– 2	54	52.4	49	47.6	
– 3	170	100	0	0	
– ≥4	0	0	0	0	
Mother's work					
– Housewife	218	100	0	0	295.2 0.001**
– Employee	6	5.8	98	94.2	
Mother's educational level					
Do not read or write	143	100	0	0	377.5 0.001**
Basic education	81	100	0	0	
Diploma/secondary school	0	0	33	100	
University or post graduated	0	0	65	100	

Table (4): Relation between mother's total reported practice toward RSV and their personal as well as social data (n=322)

Items	Bad (n=195)		Good (n=127)		Fisher – exact(P-value)
	No.	%	No.	%	
Mother's age					
– <30	132	82	29	18	270.05 0.001**
– 30-40	0	0	98	100	
– >40	63	100	0	0	
Residence					
– Rural	195	87.1	29	12.9	216.30 0.001**
– Urban	0	0	98	100	
Type Family					
– Independent	4	3.9	98	96.1	226.6 0.001**
– Extended	191	86.8	29	13.2	
Number of family members					
– 3	0	0	65	100	203.4 0.001**
– 4	21	35.6	38	64.4	
– ≥5	174	87.9	24	12.1	
Number of rooms in the house					
– 1	0	0	49	100	162.5 0.001**
– 2	45	43.7	58	56.3	
– 3	150	88.2	20	11.8	
– ≥4	0	0	0	0	
Mother's work					
– Housewife	189	86.7	29	13.3	215.08 0.001**
– Employee	6	5.8	98	94.2	
Mother's educational level					
Do not read or write	128	89.5	15	10.5	251.41 0.001**
Basic education	67	82.7	14	17.3	
Diploma/secondary school	0	0	33	100	
University or post graduated	0	0	65	100	

Table (5): Correlation matrix between mother's total knowledge as well as total reported practice about RSV and respiratory infection and crowding index (n=322)

Variable	Mother's total knowledge about RSV	Mother's total reported practice about RSV	History of respiratory infections
	r P- value	R P- value	R P- value
Mother's total knowledge about RSV		0.820** 0.001	0.269** 0.001
Mother's total reported practice about RSV	0.820** 0.001		0.210** 0.001
History of respiratory infections	0.269** .001	0.210** .001	

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

Discussion

One of the most prevalent viruses affecting children globally, the RSV is the cause of childhood bronchiolitis and pneumonia, exhibiting a range of signs and symptoms from minor infections of the upper respiratory tract to danger, life-threatening lower respiratory tract infections that necessitate hospitalization⁽¹⁵⁾. Mothers are the children's primary caregivers and are in charge of ensuring their wellbeing. Therefore, a mother's practices and knowledge are crucial for providing their children with the best care and preventing a variety of childhood illnesses. The useful information concerned how ARIs impact upper and lower respiratory infections⁽¹⁶⁾. So, the current research aimed to assess knowledge and practices regarding RSV among mothers of under five children.

As regard to age of participant mothers, the current study documented that half of mothers were below the age of 30 years old with mean \pm SD 28.4242 \pm 7.034 yrs. A

similar study done by **Abdelatty et al., (2022)**⁽¹³⁾ supported these findings they found that more than half of mothers their ages were below 30 yrs. old with mean age 27.43 \pm 2.66 yrs. On the other side, the present study results were incongruent with the findings of **Al-Noban and Elnimeiri (2022)**⁽¹⁷⁾, who found that; majority of mothers were between the ages of 30 and 39 years old with mean age 39.26 \pm 23.252. Regarding education level of participating mothers, the findings of the current study indicated that; majority of mothers does not read or write and more than three fifths of them from rural areas. Which suggests that the rate of illiteracy among Egyptian women living in rural areas is high; as a result, efforts by governmental and non-governmental organizations should be directed toward female education, especially in Upper Egypt. Also, low degree of literacy can have negative effects on the mother's awareness by different diseases which may affect their children. Consistent with the current study, **Malla (2020)**⁽¹⁸⁾ pointed out that; majority of

their studied sample cannot read or write and the high percent of them resided in rural area. Conversely, a study carried out by **Amuka et al. (2020)**⁽¹⁹⁾ reported that approximately half of the mothers had Secondary education. This difference in the degree of education may be justified by the low socioeconomic conditions among people in upper Egypt, in addition to the difference in cultural factors, where educating girls may be perceived as less valuable than educating boys.

Concerning the work status of mothers, the actual study results showed that the highest percentages of mothers were housewives and two thirds of them had more than five members in the family. This result was well matching with the results of study done by **Abdelatty et al., (2022)**⁽¹⁴⁾ who found that highest number of the mothers were housewives. Also, nearly fifty percent of them had more than five members in their families. This inconsistent with **Ebeed et al., (2023)**⁽²⁰⁾ reported that about two-thirds were working and more than one-third of them were housewives.

As regard Mothers' knowledge about RSV, the actual study indicated that; higher than two thirds of mothers had unsatisfactory level of knowledge about RSV. This was in harmony with research study done by **Khan et al., (2022)**⁽¹⁶⁾ reported that more than half of mothers had poor knowledge. Furthermore, this finding is well matched with **Saeed & Awadalla (2020)**⁽²¹⁾ they conducted study about knowledge, attitudes, and practice among mothers of under-five children about acute lower respiratory tract infections at Khartoum state and they found that, most of mothers had poor knowledge about ARIs.

Regarding to the relation among total knowledge degree of the mothers regarding

RSV and their demographic data; this research indicated that there are statistically significant differences between all items of mother's personal as well as social data and their total knowledge about Syncytial Virus ($P=0.001$). This is in accordance with **Ahmed et al., (2019)**⁽²²⁾ while it was revealed that there were statistically significant differences between demographic factors and knowledge score. Moreover, the current study result was congruent with **Abdelatty et al. (2022)**⁽¹⁴⁾, who found that mothers' mean knowledge scores varied significantly depending on their age, educational attainment, employment, family income, marital status, and family type, with $P = 0.000$ for each of these variables.

The present study illustrates that mothers' overall RSV knowledge and practices differ statistically significantly, but there is a strong positive correlation between them ($P = 0.001$). This result is consistent with **Abdul-Kareem et al., (2021)**⁽¹³⁾ who discovered a statistically significant positive correlation between mothers' overall RSV practice and knowledge scores. While the current study results disagree with **Kim and Oh, (2021)**⁽²³⁾ who found that the correlation between mothers' knowledge as well as practice level was not statistically significant.

Regarding total practice levels of the studied sample about RSV; this study showed that about two thirds of the mothers had unsatisfactory practices in management of their children with RSV, while one third of them got satisfactory practice. These supported by study done by **Al-Noban and Elnimeiri, (2022)**⁽¹⁷⁾, who documented that more than fifty of mothers had poor practices level score. Moreover, the current study results go

along with **Abdul-Kareem et al., (2021)**⁽¹³⁾ who reported that practices of mothers about respiratory diseases was very poor. Furthermore, the actual study results were in harmony with the results of the study conducted by **Saeed and Awadalla (2020)**⁽²¹⁾ in Sudan, while the majority of sample had poor practices towards ARIs. Contradicted with the current study results, **Abdelatty et al., (2022)**⁽¹⁴⁾ showed that fewer than two thirds of mothers in the study reported using adequate precautions to keep their kids from contracting ARIs.

Regarding to the relation between total practices of the mothers regarding RSV and their demographic data; this study showed that there are statistically significant differences between all items of mother's personal as well as social data and their total practice toward RSV ($P=0.001$). This finding was in accordance with **Basiouny and Hamad, (2019)**⁽²⁴⁾ while it was revealed that there were significant statistical differences between mothers' mean practice scores and social data where $P=0.000$. Contradicted to the current study finding, **Abdul-Kareem et al., (2021)**⁽¹³⁾ reported that there were non-significant associations between the practice of mothers as well as their demographic data.

Conclusion

The present research summarized that most of studied mothers had low level of knowledge related to RSV. In addition, the majority had poor level of reported practice regarding RSV. Furthermore, there is a positive significant correlation between the mother's total knowledge as well as total reported practice related RSV.

Recommendations

In light of the current findings the researcher recommendations include the following:

- Implementing an educational program for mothers about RSV and its prevention.
- Development of guidelines posters or booklets about RSV prevention and its dissemination to parents of children in pediatric care settings can be helpful.
- Develop home management awareness program for mothers to prevent RSV infection and complications.

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