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Assessment of Clinical Manifestationsand Management of Children with COVID -19 Presented at Emergency Department, King Abdullah specialized Pediatric Hospital

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Abstract
Background:*The prevalence and features of COVID-19pandemic amongchildren are mysterious,health organizations throughout the world are continuing to search for and update new signs and symptoms of COVID-19 infection in children, as well as update treatment and nursing care.The current study aimed to assess the clinical manifestations and management of children with COVID -19 presented at Emergency Department, King Abdullah Specialized Pediatric Hospital* ***Design:*** *Descriptive, retrospective design was used in this study.* ***Setting****: data collected at King Abdullah Specialist Children Hospital Emergency Department (ED).****Sample:*** *a conveniencesampleof 135 children were included in the study****.*** ***Tools:*** *The researchers developed 4 questionnaires:Demographic data, clinical manifestation,medical management, and nursing care provided questionnaire.****Results:*** *The mean age of the sample was 3.79±3.98 and the majority were male. Fever and coughwere themost common symptom. Diarrhea and vomiting were reported as less common symptoms.One-quarter of the participants had shortness of breath as a serious symptom. There was a statistically significant difference between ageand symptoms, all participants had been contacted with suspected/confirmed COVID 19 cases. Almost two thirds of the sample discharged from the (ED) while almost one-fifth of cases admitted.All nurses strictly adhere to hand hygiene and all other relevant infection control protocols, obtained a thorough history from the parents, and provide a comprehensive physical examination with an emphasis on the respiratory system****Conclusion****: The current study, concluded that fever and cough were found to be the most frequent symptoms, Shortness of breath was a serious symptom. Few children needed admission to the Pediatric Intensive Care Unit (PICU) and ventilator support. Hand hygiene and other infection control practices were closely followed by all health care providers.The nurses educated all discharged patients about home isolation guidelines.****Recommendation:****Replicate the study to screen all clinical manifestations and associated care among children in all pediatric hospitals in the kingdom.*

Keywords: *COVID-19 pandemic, children, Clinical manifestations****,****medical management, and nursing care*

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I. Introduction

Coronaviruses (CoV) are a large family of viruses (enveloped RNA viruses) that are known to cause diseases thatencompass fromcommon cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). The SARS-CoV was transmitted from civet cats to humans in 2002 in China and MERS-CoV from dromedary camels to humans in 2012 in Saudi Arabia. The novel coronavirus Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2) started in seafood and animal market in Wuhan, China where the first case was documented (Lee, et al., 2020).

The Coronavirus Disease (COVID-19) domestically spread nation-wide in China then internationally to other countries. COVID-19 has high attention globally and the World Health Organization (WHO) stated this virus as a pandemic disease in March, 2020. (WHO2020). Globally it has been reported as of 2 December 2021, 263,563,622 COVID-19 confirmed cases including 5,232,562 deaths(WHO, 2021). The American Academy of Pediatrics (APP) reported that children account for about 17.0% of the total confirmed cases of COVID-19 (APP,2021).

It has been suggested that COVID-19 affect adults more than children, and their symptoms are less severe than adults' symptoms(Cruz, & Zeichner, 2020).The most common symptoms that have been reported in the pediatric age group affected by COVID-19 were fever and dry cough (Qiu, et al., 2020). In a systematic review study by Tiago etal (2020) they reported that, the most common symptoms were fever reported in 47.5% of the cases, followed by cough (41.5%), nasal symptoms (11.2%), diarrhea (8.1%), nausea/vomiting (7.1%), fatigue (5.0%), and respiratory distress (3.5%).

Furthermore, symptoms vary between children. Sever cases are seen in children who have some conditions such as severe asthma or cystic fibrosis. These children might require Intensive Care Unit (ICU) admission (Cascella, et al., 2020, Assaker, 2020, Dong, et al., 2020).

Nurses play a critical role in managing children with COVID-19.Nurses' role doesn't include only taking care of the COVID-19 patients in the hospital, they integrate all the inter-professional teams together to decrease the dissemination of the virus to all the community. They are in front line to assess, provide holistic care to the sick patients in the hospital (Buheji and Buhaid, 2020). During the out breaks, nurses must protect themselves by specific sufficient protective equipment (Chen, etal 2020). In addition, nurses play a key role in providing psychological healing of patients During COVID-19 (Buheji and Buhaid, 2020). Because of the nature of COVID-19 unpredictable symptoms, patients found to be anxious, fearful, frustrated, angry and needs continuous reassurance and support (Orrù, etal., 2020)

Significant of the study

Most countries rely on symptom-based testing system to diagnose COVID-19. The person who exhibits specific upper respiratory tract symptoms will be asked to do COVID-19 swap. In adult population, fever and cough could be a parameter indicating that this person is highly to be infected with COVID-19 since causes of fever and cough are uncommon in healthy adults. However, in children the situation is different. Children especially in winter are susceptible to 8-10 upper respiratory tract infection (URIs) per year, so URTs such as rhinorrhea, cough and fever are likely to be less indicators of COVID-19 in children (Viner, Mytton , Bonell,etal., 2021)

The first responder to COVID-19 patients of all agesin any hospital is the Emergency Department (ED). In the ED, the children either treated and discharged from the ED or admitted to the hospital wards. Each ED has a specific plan that based on the hospital guidelines to respond appropriately to all suspected or confirmed COVID-19 cases (WHO, 2020). The EDevaluate the pediatric children according to the history of exposure, clinical findings and complains. WHO recommends that infected children with mild fever, cough withoutdyspnea or hypoxia and have no underlying conditions like asthma or chronic pulmonary disease, these children should be isolated at home (World Health Organization, 2020).

There are few studied about COVID-19 in the pediatric age group whereas most literature was on adults (Ji, et al., 2020). In addition, some studies found that some children with COVID-19 are asymptomatic(Buitrago-Garcia, etal.,2020, Gaythorpeetal, 2020). This silent asymptomatic group of children arising the possibilities of spreading the infection in societies.Knowing COVID-19 clinical symptoms in children will help the health care providers especially physicians andpediatric nurses to identify the cases and deal with them appropriately.On the other hand, because of the mysterious nature of COVID-19 pandemic among children, it is important to identify the care that provided by the ED pediatric nurse to this children.

The aim of this study isto assess the clinical manifestations and management of children with COVID -19 presented at Emergency Department, King Abdullah specialized Children Hospital.

II. Materials and Methods:

Study Area/Setting:

The research was carried out at the Emergency Department of King Abdullah Specialist Children Hospital -KASCH. Health Affairs at the Ministry of the National Guard. It is the first Specialized pediatric Hospital in the Kingdom of Saudi Arabia providing specialized pediatric treatment. The hospital has a total bed capacity of 552. Different pediatric specializations, intensive care units, play spaces, and family resource centers are all available at the hospital.

Study Subjects:

A conveniencesample of 135 children were included in the study. The inclusion criteria was male and female children, younger than 15 years and admitted to the emergency department between April and December 2020 with fever, cough, and signs of upper respiratory tract infection. Also, they have to be positive for COVID-19.

Research questions

1- What are the clinical manifestations of COVID-19 children admitted to the Emergency Department (ED)?

2- What are the medical management (i.e investigations and treatments) received by the COVD-19 children in ED?

3- What are the nursing care that provided to the COVID-19 children in ED?

4- What are the relationship between COVID-19 clinical manifestations and participant's age and gender?

5- What are the relationship between the hospital outcomes (Death, discharge, admission) and participants' age and gender?

Study Design:

Descriptive, Retrospective Chart Review (RCR) design used in this study. The RCR design is a well know research methodology that used in several health care disciplines such as nursing, epidemiology and informatics (Worster, Haines, 2004). In this design, the researcher use a pre-recorded patient's data to answer the study research questions. The data could be elicited from electronic data base or paper charts. Very valuable information can be found in the patient's records and the results of the study direct the subsequent prospective studies (Gearing, Mian, Barber, Ickowicz, 2006)

Data Collection methods

Patients' data was collected from the Hospital Information System "BEST Care" at King Abdullah Specialized Children's Hospital (KASCH), Riyadh, Saudi Arabia. The BEST Care system is a complex medical software that contains all the patient's medical history and interactive patient self-service. The researchers developed 4 questionnaires: sociodemographic data, clinical manifestation, medical management, and nursing care provided questionnaire. The content validity of the study questionnaires was established by using a panel of 3 experts in pediatric nursing.

1. Demographic data questionnaire

The questionnaire includes information about the children's age, gender, date of admission and discharge.

2. Clinical manifestation questionnaire

The questionnaire contains 15 items and developed by the researchers. The questions about COVID-19clinical manifestationswas classified according to the WHO (2020) to **Most common symptoms (**fever, cough,runny nose **body ache), less common (**sore throat, diarrhea, vomiting, headache), **serious symptoms** (shortness of breath, chest pain, loss of speech or mobility, confusion). Also questions about history of contact with suspected or confirmed Covid-19 case, contact with camel or camel products in the last 14 days. In addition, the hospital outcome of the cases was also included in the questionnaire (admitted, discharged, and died).

3. Medical management

Medical management checklistwas used to collect the data from the BESTCare system. The checklist contains 5 yes and no questions. The questions were related to:the treatment that the patient received, Lab results and diagnostic procedures

4. Nursing care provided

The nursing care provided to the COVID-19 children in the ED was collected from the hospital BEST care system. The system contains all documented nursing care provided to the children in the nursing documentation notes part. A checklist that has 10 yes and no questions were used. the questions were related to: nurses adherence to infection control measures, history taking, physical assessment, growth measurements, report any abnormalities, provide oxygen therapy, children nutritional needs, skin care provided, discharge education regarding home isolation

Statistical Analysis:

All statistical tests were conducted using SPSS for windows version 25.0.data were coded, and descriptive statistics were used to summarize the demographic characteristics of the participants (e.g means, standard deviations, percentages. The categorical data were analyzed and expressed in frequency and percentage. Chi-square test was used to identify the relationship between the variables. While the continues variable will be utilized by mean and standard deviation. Association between the demographic variables and the patients' symptoms Statistical significance was set at $p<0.05$.

Ethical Considerations:

The approval of the Collage of Nursing-Riyadh Research Unit (CON-R) and the Institutional Review Board (IRB) from the King Abdullah International Medical Research Center (KAIMRC) in Riyadh. After the study was completed, all information was kept secret and discarded. Participants' privacy and confidentiality were respected, no identifiers were recorded, and all data was kept in a secure place, including soft and hard copies, with only the study team having access to it. All information supplied would be treated confidentially in compliance with IRB and KAIMRC regulations.

III. Results

Table (1) Demographic characteristics of the participants (N=135)

Items	No	%
Age groups		
▪ < 1 year	59	43.7
▪ 1: 6 years	55	40.7
▪ < 6: 12 years	17	12.6
▪ > 12 years	4	3
Mean ±SD	3.79±3.98	
Gender		
▪ Male	74	54.8
▪ Female	61	45.2

Table (1) indicated that the majority of the participants (43.7%) were younger than one year. The mean age was 3.79±3.98. More than half of the children (54.8%) were male.

Table (2) Participants' clinical manifestations and history (N=135)

Items	No (Absent)		Yes (Present)	
	No	%	No	%
Most common symptoms				
▪ Fever	45	33.3	90	66.7
▪ Cough	71	52.6	64	47.4
▪ Runny nose	110	81.5	25	18.5
▪ Body ache	122	90.4	13	9.6
Less common symptoms				
▪ Sore throat	122	90.4	13	9.6
▪ Diarrhea	98	72.6	37	27.4
▪ Vomiting	97	71.9	38	28.1
▪ Headache	129	95.6	6	4.4
Serious symptoms				
▪ Shortness of breath	101	74.8	34	25.2
History				
▪ Contact with suspected/ confirmed cases	0	0	135	100
▪ Contact with camel/products (last 14 days)	135	100	0	0

Table (2) highlighted that the most common COVID-19 symptoms were fever (66.7%) followed by cough (47.4%). While diarrhea and vomiting were reported as less common symptoms (27.4 %, 28.1 %respectively). One-quarter (25.2%) of the participants had shortness of breath as a serious symptom. 100 %, of the participants had been contacted with suspected/confirmed COVID 19 cases.

Table (3)Investigation and treatmentreceived by the participants (N=135)

Investigation and Treatment type	No		Yes	
	No	%	No	%
Requested Laboratory studies (CBC), kidney, liver function	125	92.6	10	7.4
CT chest	40	29.6	95	70.4
Antibiotic	124	91.9	11	8.1
Antibiotic type (N=11)				
▪ Cefetraxione	0	0	8	72.7
▪ Cefetraxion &Vancomycin	0	0	1	9.1
▪ Cefetraxion & Azithro	0	0	2	18.2
Corticosteroid	134	99.3	1	0.7
Oxygen therapy	2	1.5	133	98.5
Mechanical ventilation	107	79.3	28	20.7

Table (3) revealed that the physician requested a lab investigation for only 7.4% of the participants, while more than two-thirds (70.4%) required a chest CT scan. The physician prescribed antibiotic to 8.1 % of the children, the most common prescribed antibiotic was Cefetraxione. Corticosteroid was prescribed for 0.7% of the participants. 98.5 % received oxygen therapy, with more than one-quarter (20.7%) needed mechanical ventilation.

Table (4)Nursing careprovidedto The Studied Sample (N=135)

Nursing care items	No		Yes	
	No	%	No	%
Adhere to hand hygiene and all other relevant infection control protocols (Personal Protective Equipment,PPE)	0	0	135	100
Take complete history from the child's parents	0	0	135	100
Provide complete physical assessment focus on respiratory system	0	0	135	100
Record Growth measurements	0	0	135	100
Monitor and report any abnormality in respiratory system	0	0	135	100
Monitor Oxygen therapy	2	1.5	133	98.5
Provide complete observation to children who need Mechanical ventilation	107	79.3	28	20.7
Monitor Nutrition and feeding	34	25.2	101	74.8
Provide Skin Care	60	44.5	75	55.5
Provide instructions about home isolation to discharged patients	30	22.2	105	77.8

Table 5 demonstrated that all nurses (100%) strictly adhere to hand hygiene and to the PPE protocol. In addition, all the nurses obtained a complete history from the parents andprovided a comprehensive physical examination with an emphasis on the respiratory system, since this is a critical component of COVID-19 symptoms.

The nurses offered skin care to more than half of the infected children (55%), as well as monitoring nutrition and feeding to almost two-thirds (74.8%) of the cases, and 77.8 % of discharged patients received instructions on home isolation.

Figure (1) Hospital outcome of the study participants (N=135)

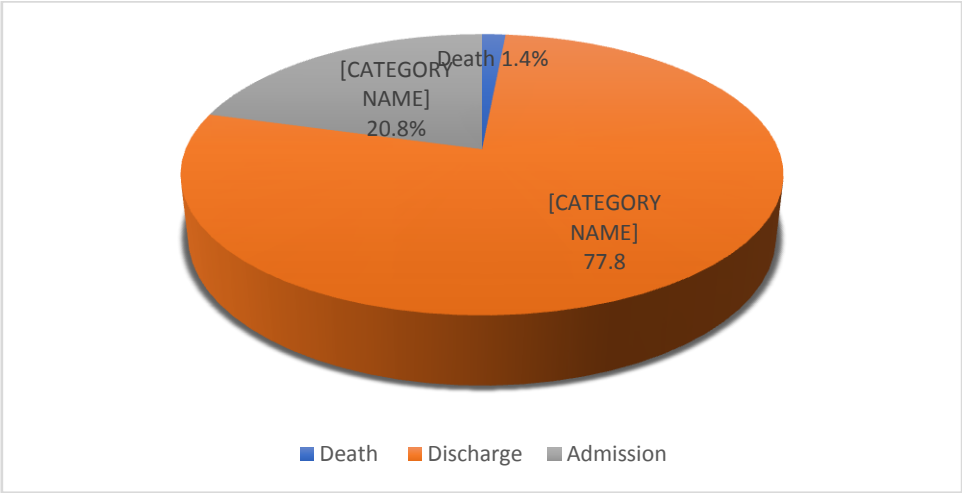

Figure (1) shows that 77.8% of the participants discharged from the ED and 20.8 % of cases admitted to the hospital.1.4 % of the participants died.

Table (5) Relationship between hospital outcome and the participant's age and gender (N=135)

Items	**Death**		**Discharge**		**Admission**		Significance test
	No	%	No	%	No	%	
Age group							
▪ < 1 year	1	0.7	50	37.1	8	5.9	$X^2 = 8.555$
▪ 1: 6 years	1	0.7	37	27.4	17	12.7	*p*=0.200
▪ < 6: 12 years	0	0	15	11.6	2	1.5	
▪ > 12 years	0	0	3	2.2	1	0.7	
Gender							$X^2 = 2.108$
▪ Male	1	0.7	61	46.7	12	8.9	*p*=0.550
▪ Female	1	0.7	44	33.6	16	11.9	

Table (5) There was no statistical significance relationship between gender, age, and the hospital outcome of the study participants.

Table (6) Relationship between symptoms and participant's age and gender (N=135)

Items	**Most common**		**Less common**		**Serious**		**Significance test**
	No	%	No	%	No	%	
Age group							
▪ < 1 year	40	29.6	9	6.7	10	7.4	$X^2 = 26.923$
▪ 1: 6 years	14	10.4	23	17	18	13.3	*p*=0.000**
▪ < 6: 12 years	9	6.7	5	3.7	3	2.2	
▪ > 12 years	1	0.7	0	0	3	2.2	
Gender							
▪ Male	37	27.4	18	13.3	19	14.1	$X^2 = 0.816$
▪ Female	27	20	19	14.1	15	11.1	*p*=0.665

Table (6) There was a statisticalsignificance difference between age group and COVID-19 symptoms X^2 =26.923 p=0.000. Nearly one-third 29.6% of the study group less than one year had the most common symptom, while 13.3 % of the study group recorded serious symptom as difficult breathing. There was no statistically significant difference between gender and COVID-19 symptoms.

IV. Discussion

The result of the current study shows that the mean age of the children who have COVID-19 was 3.79±3.98 and only 3% were older than 12 years. These results were supported by Zheng etal, (2020). The researchers assessed the clinical characteristics of children with Coronavirus and found that 44% of the infected children's age ranged between one month to 3 years, with a mean age of 3 years. This result contradicted withDong etal (2020) who studied epidemiology of COVID-19 among children in China and documented that 46.1% of infected children with COVID-19 were more than 10 years. As well as, Lu,etal (2020) who concluded that most common age with infected virus werechildren aged from 6 to 10 years.

The current study revealed that more than half of the participants were males. This result congruent with (Dong, etal 2020;Zheng etal, 2020& Lu, etal 2020) who found that most of COVID-19 infected children who were admitted to the emergency were males. These findings contradicted those of DeBiasiet al., (2020) who found that males and females were equally represented among infected children.

The current study reported that no statistical significance between gender, age, and the outcome of the studied sample. All studies done among children reported that covid 19 infection and illness have a higher likelihood of being male. In a collection of 2490 pediatric COVID-19 cases in the United States, boys were shown to be more prevalent in all age groupings, but no information was provided on the influence of gender on disease severity. There was no significant difference in the number of instances reported between boys and girls among the 2143 Chinese children with COVID-19 in Dong, etal 2020 study, and no comprehensive information on the gender of the severe and critical cases was provided. Zheng etal,(2020)highlighted that 52 percent of children with COVID-19 admitted to intensive care units in the United States and Canada were males.

As regards to the most common symptom, the currents study highlighted that nearly two-thirds of the study's sample had fever, and nearly half had cough. This result was confirmed by several studies such as Tsabouri, Makis, Kosmeri, &Siomou, (2020); Zheng etal , (2020) and WHO (2020). They documented that fever followed by cough is the first sign of COVID 19 symptoms among children It was evident from the results of the current study that the diarrhea and vomiting were reported as less common symptoms. One-quarter of the study's sample had shortness of breath as a serious symptom.on the same line, Zheng etal , (2020) hightlithed that , nealy 12%of childern admitted to the ER with digestive symptoms such stomach discomfort,

vomiting, and diarrhea at first. Only just few 8% children with severe illnesses developed respiratory problems and were admitted to the hospital for treatment and Chu, Englund, & Starita (2020) reported that around one-quarter of children with Covid-19in their study which done in pediatric emergency departments in Italy had little or poor feeding, as well as Rhinorrhea.

There was a statistically significant difference between children age and COVID-19 symptoms (X^2 =26.923 p=0.000). In a study of 2135 children from China with suspected and confirmed COVID-19, serious symptoms were documented in 10.6% of those under the age of one year, 7.3 percent of those aged one to five years, and 4.1 percent of those aged six to ten years. A recent research from Italy, found that 27 percent of the children in the study had an underlying medical condition. Five of the nine children who required breathing assistance were under the age of one year, and six of them had a medical problem (Chu, Englund, &Starita, 2020)

In addition, the study's results indicated that all the children had COVID-19 swaps performed and, all participants had been contacted with suspected/confirmed COVID 19 cases. This results warranty more investigation to find out the source of infection for these children. Regarding the treatment received by the study participants, 8.1 % of the children received antibiotics and corticostorids. The most common antibiotic used was Cefetraxione. This proportion of children who use antibiotics in this study is less than the reported proportion in other studies. Wang, 2020 reported that the proportion of antibiotics use in their systematic reviewed researches ranged from 19.4% to 100.0% in children and 13.2% to 100.0% in adults, in the absence of etiological requirements. The most commonly used antibiotics in adults were quinolones, cephalosporins and macrolides and in children meropenem and linezolid.

20.8% of the infected children required hospital admission. Tagarro, Epalza, Santos (2020) reported that, in Madrid, 60% of confirmed infections in children required hospital admission. This issue regarding the low percentage of hospital admission in our study compared to the reports of other studies warrantee more investigation. The respiratory support such as oxygen administration for almost all the children admitted to ER, increased awareness of COVID-19 treatment and high-quality nursing care provided might interpretate this results. A chest CT scan was used to diagnose more than two-thirds of the cases. some cases required PICU admission. Zheng et al. (2020) reported that all admitted cases to PICU exhibited unilateral or bilateral lung involvement.

The current study demonstrated that all nurses strictly adhere to hand hygiene and all other relevant infection control protocols such as Personal Protective Eqipment (PPE). All research have revealed that all health-care providers must strictly adhere to WHO infection-control standards to protect themselves and others. In published research by Heinzerling etal (2020), Personal protective equipment (PPE) was worn and protected thiety seven health care personnel (HCP) from infection, according to the report.

The pediatric nurses obtained a complete history from the parents and provided a comprehensive physical exam with an emphasis on the respiratory system. Chen, etal (2020) reported that the taking history is very crucial in treating COVID-19 patients. In addition, pediatric nurses provided skin care to more than half of the infected children. Skin care was offered to children who complained of vomiting and diarrhea. All the provided care was documented in the patients' record in the best care system. Monitoring nutrition and feeding and giving oxygen therpy was also a nurse's responsibilities

As most of the patients were discharged, the nurses provided home care instructions for the parents. WHO (2020) has developed an interim guidance that has all the necessary recommendation related to management of COVID-19 patients who present with mild symptoms. This recommendation related to importance of hand, management of the household contacts, and prevention of infection spreading measures. Further studies needed to make sure that the parents follow all the recommended measures.

V. Conclusion and Recommendation

The current study findings concluded that, the most common symptoms among the children admitted to ER were fever and cough. Diarreha and vomiting were a less common gastrointestinal symtoms while shortness of breath was the most sever symptom. Few children needed admission to the PICU and ventilator support. Although upper respiratory symptoms were characteristic of COVID-19, some patients presented with mild or often overlooked symptoms such as body ache and headache. All the nurses were adhered to infection control protocols, obtain complete history, and provided physical examination as was documented in the system. Chest CT was the most common requested radiology and almost all the children needed oxygen therapy support.

In light of the importance of COVID-19 and the unaviliabilty of information about this pandemic, so the researchers recommended the following: -

- Replicate the study to screen all clinical manifestations and associated care among children in all pediatric hospitals in the kingdom.

- Further prospective studies needed to determine the physical and psychlogical impact of COVID-19 infection on the affected chidren especially children who were admitted to the PICU. Also to observe the nurses while they provide nursing care to the COVID-19 children

Limitations

There are certain limitations to the current study. Convenience sampling method was used to recruit the study subjects and this limit the generalizability of the study results. Also, the study utilized an RCR designand insufficient data might be documented in theBEST Care system regarding medical and nursing management.

Bibliographic References:

[1]. American Pediatric Association (2021). Available at:.https://www.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/children-and-covid-19-state-level-data-report/

[2]. Assaker R., et al., (2020) Presenting symptoms of COVID-19 in children: a meta-analysis of published studies, British Journal of Anaesthesia,Volume 125, Issue 3,

[3]. Buheji and Buhaid (2020) Nursing Human Factor During COVID-19 Pandemic International Journal of Nursing Science 2020, 10(1): 12-24 DOI: 10.5923/j.nursing.20201001.02

[4]. Buitrago-Garcia D, Egli-Gany D, Counotte MJ, Hossmann S, Imeri H, Ipekci AM, et al. (2020) Occurrence and transmission potential of asymptomatic and presymptomatic SARS-CoV-2 infections: A living systematic review and meta-analysis. PLoS Med 17(9): e1003346. https://doi.org/10.1371/journal.pmed.1003346Cascella M., Rajnik M., Cuomo A., Dulebohn S. C., Napoli R. D., (2020). Features, evaluation, and treatment coronavirus (COVID-19). Stat Pearls Bookshelf ID: NBK554776.

[5]. Chen, N., Zhou, M., Dong, X., Qu, J., Gong, F., Han, Y., Qiu, Y., Wang, J., Liu, Y., Wei, Y., Xia, J., Yu, T., Zhang, X., & Zhang, L. (2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet (London, England)*, *395*(10223), 507–513. https://doi.org/10.1016/S0140-6736(20)30211-7

[6]. Choi, S., Kim, H. W., Kang, J., Kim, D. H., Cho, E. Y., (2020). Epidemiology and clinical features of coronavirus disease 2019 in children. Korean Journal of Pediatrics. 2020; 63:125–132.

[7]. Chu, H., Englund, J. and Starita, WA. (2020) Children with Covid-19 in Pediatric Emergency Departments in Italy, N Engl J Med 2020; 383:187-190
DOI: 10.1056/NEJMc2007617

[8]. Cruz A. T., & Zeichner S.L., (2020). COVID-19 in children: Initial characterization of the pediatric disease. America Acad Pediatrics 145: e20200834.

[9]. DeBiasi, R. L., Song, X., Delaney, M., Bell, M., Smith, K., Pershad, J., Ansusinha, E., Hahn, A., Hamdy, R., Harik, N., Hanisch, B., Jantausch, B., Koay, A., Steinhorn, R., Newman, K., & Wessel, D. (2020). Severe Coronavirus Disease-2019 in Children and Young Adults in the Washington, DC, Metropolitan Region. *The Journal of pediatrics*, *223*, 199–203.e1. https://doi.org/10.1016/j.jpeds.2020.05.007

[10]. Dong, Y., Mo, X., Hu, Y., Qi, X., Jiang, F., Jiang, Z., & Tong, S. (2020). Epidemiology of COVID-19 Among Children in China. Pediatrics, 145(6), e20200702. doi: 10.1542/peds.2020-0702.

[11]. Gaythorpe K, Bhatia S, Mangal T, et al (2020). Report 37: Children's role in the COVID-19 pandemic: a systematic review of early surveillance data on susceptibility, severity, and transmissibility. https://spiral.imperial.ac.uk/handle/10044/1/84220.

[12]. Gearing RE, Mian IA, Barber J, Ickowicz A. A methodology for conducting retrospective chart review research in child and adolescent psychiatry. J Can Acad Child Adolesc Psychiatry. 2006;15:126–134. [PMC free article] [PubMed] [Google Scholar]

[13]. Heinzerling, A., Stuckey, M. J., Scheuer, T., Xu, K., Perkins, K. M., Resseger, H., Magill, S., Verani, J. R., Jain, S., Acosta, M., & Epson, E. (2020). Transmission of COVID-19 to Health Care Personnel During Exposures to a Hospitalized Patient - Solano County, California, February 2020. *MMWR. Morbidity and mortality weekly report*, *69*(15), 472–476. https://doi.org/10.15585/mmwr.mm6915e5

[14]. Ji L. N., Chao S., Wang Y. J., Li X. J., Mu X. D., et al. (2020) Clinical features of pediatric patients with COVID-19: a report of two-family cluster cases. World J Pediatrics 16: 356-362.

[15]. Lee PI, Hu YL, Chen PY, Huang YC, Hsueh PR (2020). Are children less susceptible to COVID-19? J Microbiol Immunol Infect. 53:371-372.

[16]. Lu X, Zhang L, Du H, et al. (2020) SARS-CoV-2 infection in children. N Engl J Med 2020;382:1663-1665.

[17]. Orrù, G., Ciacchini, R., Gemignani, A., Conversano, C. (2020). Psychological intervention measures during the COVID-19 pandemic. Clinical Neuropsychiatry, 17 (2), 76-79

[18]. Qiu H, Wu J, Hong L, Luo Y, Song Q, et al., (2020). Clinical and epidemiological features of 36 children with coronavirus disease 2019 (COVID-19) in Zhejiang, China: an observational cohort study. Lanc Infect Dis 20: 689-696.

[19]. Tagarro A, Epalza C, Santos M, et al. (2020). Screening and Severity of Coronavirus Disease 2019 (COVID-19) in Children in Madrid, Spain. *JAMA Pediatr*. 2021;175(3):316–317. doi:10.1001/jamapediatrics.2020.1346

[20]. Tiago, etal. (2020).Clinical Manifestations of Children with COVID-19: a Systematic ReviewmedRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY-NC-ND 4.0 International license.

[21]. Tsabouri, S., Makis, A., Kosmeri, C., &Siomou, E. (2020). Risk Factors for Severity in Children with Coronavirus Disease 2019: A Comprehensive Literature Review. *Pediatric clinics of North America*, *68*(1), 321–338. https://doi.org/10.1016/j.pcl.2020.07.014

[22]. Viner RM, Mytton OT, Bonell C, et al. Susceptibility to SARS-CoV-2 Infection among Children and Adolescents Compared with Adults: A Systematic Review and Meta-analysis. *JAMA Pediatr*. 2021;175(2):143–156. doi:10.1001/jamapediatrics.2020.4573

[23]. Wang, J., Tang, Y., Ma, Y., Zhou, Q., Li, W., Baskota, M., Yang, Y., Wang, X., Li, Q., Luo, X., Fukuoka, T., Ahn, H. S., Lee, M. S., Luo, Z., Liu, E., Chen, Y., (2020). COVID-19 Evidence and Recommendations Working Group Efficacy and safety of antibiotic agents in children with COVID-19: a rapid review. *Annals of translational medicine*, *8*(10), 619. https://doi.org/10.21037/atm-20-3300

[24]. WHO (2020) Covid19? [online] Available at: <https://covid19.who.int/table> [Accessed11 November 2020].

[25]. WHO World Health Organization (2020). Home care for patients with COVID-19 presenting with mild symptoms and management of their contacts [online]. Website https://www.who.int/publications-detail/home-care-for-patients-with-suspected-novel-coronavirus-(ncov)-infection-presenting-with-mild-symptoms-and-management-of-contacts [accessed 10 April 2020].

[26]. WHO World Health Organization (2020). Available at: https://www.who.int/dg/speeches/ detail/who-director-general-statement-on-ihr-emergency-committee-on-novel-coronavirus-(2019- ncov). Accessed March 3, 2020

[27]. WHO World Health Organization (2021). Available at: https://covid19.who.int
[28]. Worster A, Haines T. Advanced statistics: understanding medical record review (MRR) studies. AcadEmerg Med. 2004;11:187–192. http://dx.doi.org/10.1111/j.1553-2712.2004.tb01433.x. [PubMed] [Google Scholar]
[29]. Zheng F., Liao C., Fan Q.H., et. al.: (2020). Clinical Characteristics of Children with Coronavirus Disease 2019 in Hubei, China. Curr Med Sci 2020; 40: pp. 275-280.

Hala Saied, et. al. "Assessment of Clinical Manifestations and Management of Children with COVID -19 Presented at Emergency Department, King Abdullah specialized Pediatric Hospital." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 10(06), 2021, pp. 01-09.