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From Chief Editors Desk

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Dr. Bincy R



EFFECT OF BREATHING EXERCISES ON CARDIOPULMONARY PARAMETERS OF CHILDREN WITH BRONCHOPNEUMONIA

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Abstract

*Breathing exercises are useful for preventing or reducing the respiratory tract infections in children. The study was titled **Effect of breathing exercise on cardiopulmonary parameters of children with bronchopneumonia**. The primary objective is to evaluate the effect of breathing exercise on cardio pulmonary parameters of children with bronchopneumonia and the secondary objective is to evaluate the effect of breathing exercise on clinical outcome among children with bronchopneumonia. The research approach adopted was quantitative and the design was quasi experimental. Sixty children at an age of 6 to 12 years with bronchopneumonia were selected according to the inclusion criteria. The first 30 children were consecutively selected from ward 4 and allocated to the control group; they will receive only the routine care given in the hospital. Cardiopulmonary parameters are assessed on the day of admission upto the 5th day of the admission in the morning session. After completing the data collection from the control group, children were selected from ward 3 and added to the experimental group. Breathing exercises such as Bunny breathe; Bumble bee breath and Balloon breathing are provided to the experimental group in addition to the routine institutionalized care. Cardiopulmonary parameters are assessed in on the day of admission upto the 5th day of the admission in the morning session. After that breathing exercises are provided 30 minutes thrice daily. Results showed that the mean cardiopulmonary parameters were significantly improved in experimental group ($p < 0.01$) compared to the control group. It is evident from the study that breathing exercises such as Bunny breathe, Bumble bee breath and Balloon breathing are improved the cardiopulmonary parameters in children with bronchopneumonia. So, it can be concluded that breathing exercises such as Bunny breathe, Bumble bee breath, and Balloon breathing are improves the cardiopulmonary status in children with bronchopneumonia.*

***Key words:** breathing exercises; cardio pulmonary parameters; broncho- pneumonia*

INTRODUCTION

Healthy children brought up in healthy surroundings are only source of joy to everyone, but also India's greatest resource tomorrow. Children are not little adults.¹

Everyday functions of the body like digesting food, moving muscles or even just thinking, need oxygen. When these processes happen, carbon dioxide is produced as a waste product. The job of your lungs in this system is to provide these processes with oxygen and to get rid of the waste gas, carbondioxide²

Respiratory infections are the leading cause of mortality in children below 5 years in both developing and developed countries. Mortality in children below 5 years is attributed to lower respiratory tract infection is 16%.³

Lower respiratory tract infections are generally more serious than upper respiratory tract infection. The two common lower respiratory tract infections are bronchitis and pneumonia. Pneumonia killed 9, 20,136 children under 5 in 2015, accounting for 16% of all deaths of children under 5-year old.⁴

It was estimated that in 2016, lower respiratory infections were a leading infectious cause of mortality worldwide in children younger than 5 years (under-5; 652572 deaths). Most of the deaths due to lower respiratory infection in children younger than 5 years occurred in the first year of life.⁵

Pneumonia accounts for 15% of all deaths of children under 5 years old, killing 808 694 children in 2017. Pneumonia can be caused by viruses, bacteria, or fungi. Pneumonia can be prevented by immunization, adequate nutrition, and by addressing environmental factors. Pneumonia caused by bacteria can be treated with antibiotics, but only one third of children with pneumonia receive the antibiotics they need and supportive therapy such as breathing exercises, chest physiotherapy are help to increase the respiratory functions of children.

Statement of the problem

Effect of breathing exercise on cardio pulmonary parameters of children with bronchopneumonia admitted in tertiary care centre, Thiruvananthapuram.

Objectives

Primary objective

To evaluate the effect of breathing exercise on cardio pulmonary parameters of children with bronchopneumonia

Secondary Objective

To evaluate the effect of breathing exercise on clinical outcome among children with bronchopneumonia.

MATERIALS AND METHODS

The research approach adopted for the study was quantitative approach. The research design selected for the study was quasi experimental research design. In this study the settings were pediatric medical wards, Sree Avittom Thirunal Hospital, Thiruvananthapuram.

Samples are selected consecutively. From the control group data were collected by using interview schedule and cardiopulmonary assessment chart. Interview schedule include socio-demographic data and clinical data. Cardiopulmonary assessment chart consists of heart rate, respiratory rate, oxygen saturation, peak expiratory flow rate and simplified cough symptom score. After collecting data the control group were received the routine care. Data collected on the admission day considered as pre-observation (O1). Cardiopulmonary assessment done from the admission day to the 5th day in morning. From the second day observation to the fifth day observation is represented as O2, O3, O4,O5.

In the experiment group, data collected using the interview schedule and cardiopulmonary assessment chart on the day of admission and was considered pre- intervention observation and

assessment (O1). In addition to the routine care, after demonstration of breathing exercises such as bunny breath, bumble bee breath, and balloon breathing and showed a video of the breathing exercise ask the children to do it. It is done 30minutes thrice daily, in morning, noon and evening. Observation and assessment done in morning before breathing exercise from the second day of admission to the 5th day and is considered post intervention observation and assessment. In this group the post intervention from the second day to the fifth day is represented as O2, O3, O4, and O5.

Description of the tool

Tool 1: Structured interview schedule for collecting socio-demographic data and clinical data

Section 1

Interview schedule for collecting socio demographic data include age, sex, birth order of the child, place of residence, type of house, presence of smokers in the home and presence of any pet animal in the home.

Respiratory Rate

Table 1: Effect of breathing exercise on respiratory rate of children in control and experimental group n=60

<i>Source</i>	<i>Type III Sum of Squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F</i>	<i>p.</i>
Between groups	264643.29	1.00	264643.29	3834.02	0.001
Within the groups	292.48	1.00	292.48	4.24	0.044

From the table 1 it was evident that mean respiratory rate was statistically significant in between groups (F=3834.02.p=0.001) and within the groups (F=4.24,p=0.044)among control and experimental group.

HEART RATE

Table 2 : Effect of breathing exercise on heart rate of children in control and experimental group n=60

<i>HEART RATE</i>	<i>Type III Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>P</i>
Between experimental and control groups	4205094.41	1.00	4205094.41	9296.39	0.001
Within experimental and control groups	0.48	1.00	0.48	0.00	0.97

Section 2

Interview schedule for collecting clinical data of the child include date of admission, anthropometric measurement, nutritional status, immunization status, history of repetitive respiratory infections, using nebulization and antibiotic for treatment, date of discharge, presence of any symptoms during discharge.

Tool 2: Simplified cough symptom score

Tool 3: cardiopulmonary assessment chart

Cardio pulmonary assessment chart: it includes respiratory rate, heart rate, oxygen saturation, peak expiratory flow rate, and simplified cough symptom score - day and night.

RESULTS

In this present study, group were comparable based on socio-demographic data like age, sex, presence of smoker and pets in thehouse etc and clinical data.

From table 2 it was evident that mean heart rate was statistically significant in between groups ($F=9296.39$, $p=0.001$) and within the groups was not statistically significant ($F=0.00$, $p=0.97$) among control and experimental group.

OXYGEN SATURATION

Table 3: Effect of breathing exercise on oxygen saturation of children in control and experimental group n=60

<i>Oxygen saturation</i>	<i>Type III Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>P</i>
Between experimental and control groups	2745250.68	1.00	2745250.68	911382.16	0.001
within experimental and control groups	117.81	1.00	117.81	39.11	0.001

From the table 3 it evident mean oxygen saturation was statistically significant in between groups ($F=911382.16$ $p=0.001$) and within the groups ($F=39.11$, $p=0.001$) among control and experimental group

PEAK EXPIRATORY FLOW RATE

Table 4: Effect of breathing exercise on peak expiratory flow rate of children in control and experimental group n=60

<i>PEFR</i>	<i>Type III Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>p.</i>
Between experimental and control groups	3113045.33	1.00	3113045.33	650.72	0.001
Within experimental and control groups	52801.33	1.00	52801.33	11.04	0.002

Table 4 it was evidenced that mean peak expiratory flow rate was statistically significant in between groups ($F=650.72$, $p=0.000$) and within the groups ($F=11.04$, $p=0.002$) among control and experimental group

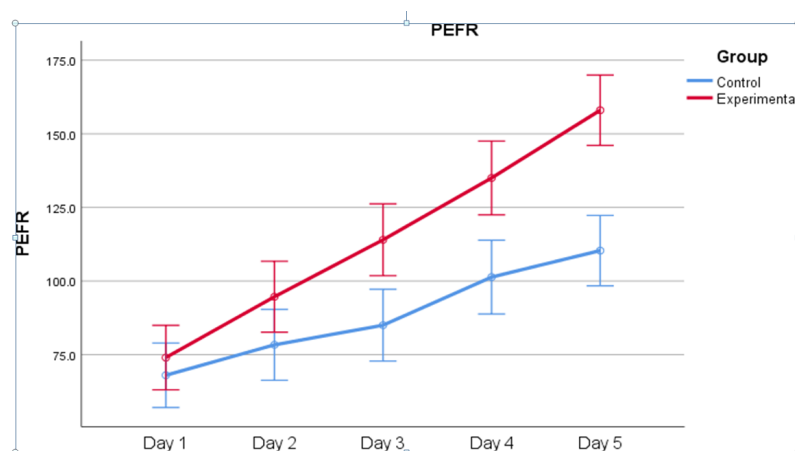


Figure 1: Comparison of children in control and experimental group based on peak expiratory flow rate

The figure 1 shows that the Peak expiratory flow rate was increasing from the day of admission to the 5th day in experimental group than control group

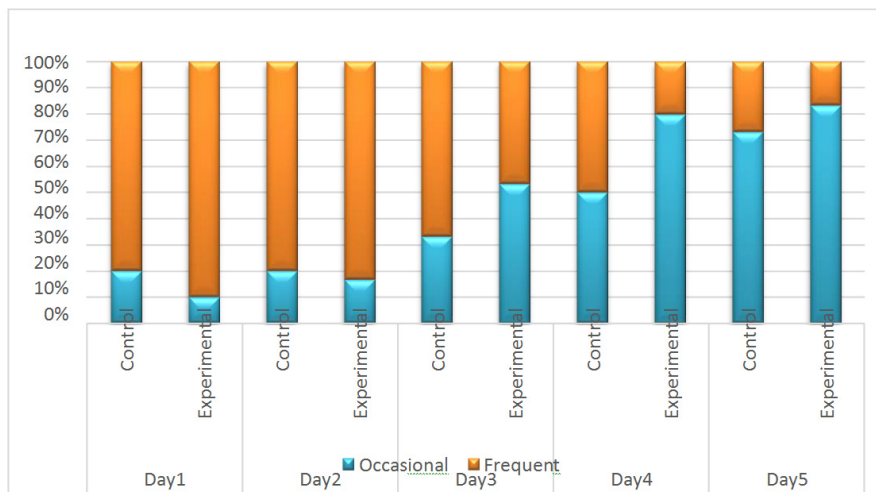


Figure 2 Comparison of children in experimental and control group according to day time simplified cough symptom score

The figure 2 reveals that on the day 1 the children in the experimental group and the control group had frequent cough during day time but it was decreased day by day and the last day that is O5 the cough was present only occasionally in both groups. It may be due to the presence of antibiotics and nebulization is given as a treatment.

n=60

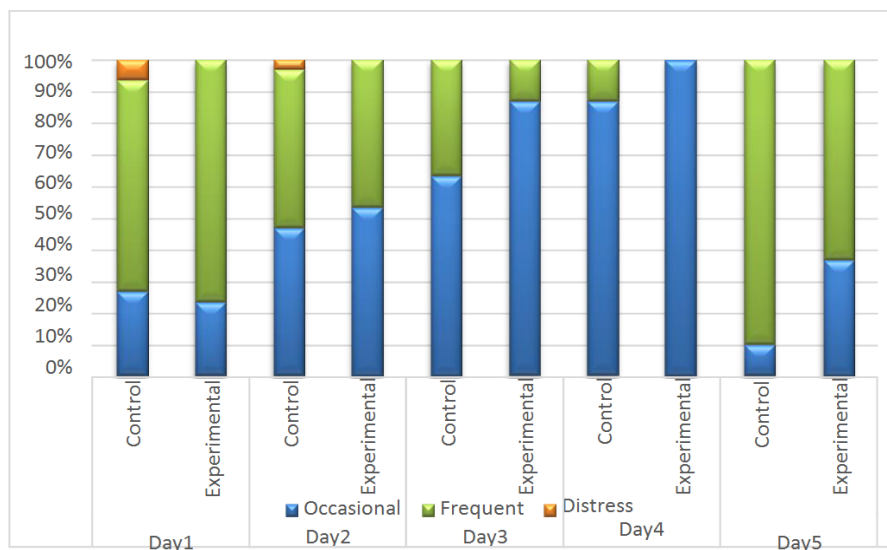


Figure3: Comparison of children in experimental and control group according to night time simplified cough symptom score

The figure 3 inferred that on the day 1 the children in the experimental group and the control group had frequent cough during night time. On the day 1st and 2nd day some children in the control group had distressed cough during night time. But it was decreased day by day and the last day that was O5 the cough was present occasionally in experimental group than control group. It may be due to the treatment with antibiotics and nebulization

Table 5: Effect of breathing exercise on duration of the hospital stay of children in the experimental group and control group n=60

<i>Duration of hospital stay</i>	<i>Control</i>		<i>Experimental</i>		<i>x²</i>	<i>df</i>	<i>P</i>
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>			
5	10	33.3	28	93.3	23.2	1	0.001
7	20	66.7	2	6.7			

The table 5 shows 93.3% of children in the experimental group were discharged in 5th day and 6.7% of children discharged after one week. In the control group 33.3% children discharged within 5th day. 66.7% of children from control group and 6.7 % from the experimental group need more than 7 days of hospital admission for recovery. Hence $p=0.001$, it was understood that the breathing exercise was significant effect on duration of hospital stay of children with bronchopneumonia.

Effect of breathing exercise on cardio-pulmonary parameters

Respiratory rate

The 'F' value for respiratory rate on experimental and control group in relation to the breathing exercise is 4.24 and is significant ($p=0.04$). Hence it can be inferred that breathing exercises has got a significant effect on the respiratory rate.

Heart rate

The 'F' value for respiratory rate on experimental and control group in relation to the breathing exercise is 0.00 and is not significant ($p=0.97$). Hence it can be inferred that breathing exercises not have a significant effect on the heart rate.

Oxygen saturation

The 'F' value for oxygen saturation within experimental and control group in relation to the breathing exercise is 39.11 and is significant ($p=0.000$). Hence it can be inferred that breathing exercises have a significant effect on the oxygen saturation.

Peak expiratory flow rate

The 'F' value for oxygen saturation within experimental and control group in relation to the breathing exercise is 11.04 and is significant

($p=0.002$). Hence it can be inferred that breathing exercises have a significant effect on the peak expiratory flow rate.

Simplifies cough symptom score

Day time simplifies cough symptom score

It was evidenced that, on the day 1 the children in the experimental group and the control group have frequent cough during day time but it was decreased day by day and the last day that is 05 the cough was present only occasionally in both groups. It may be due to the presence of antibiotics and nebulization is given as a treatment.

Night time simplified cough symptom score

In this study it was identified that, on the day 1 the children in the experimental group and the control group have frequent cough during night time. On the day 1st and 2nd day some children in the control group have distressed cough during night time. But it was decreased day by day and the last day that is 05 the cough was present occasionally in experimental group than control group. It may be due to the treatment with antibiotics and nebulization

Clinical outcome

In this study 93.3% of children in the experimental group were discharged in 5th day and 6.7% of children discharged after one week.

In the control group 33.3% children discharged within 5th day. 66.7% of children from control group and 6.7 % from the experimental group needed more than 7 days of hospital admission for recovery.

DISCUSSION

The present study used quasi experimental design to evaluate the effect of breathing exercises on cardio-pulmonary parameters of children with bronchopneumonia.

A quasi experimental study to evaluate the effect of breathing exercises as play way method, it was reported that all children used peak expiratory flow meter had lower the symptom days. The present study also revealed that improved peak expiratory flow after breathing exercises, indirectly reflecting the increase in oxygen saturation lessen the symptomatic cough symptom score and lessens the other symptom days as a result of this breathing exercises.⁷

A study conducted on inspiratory muscle training and breathing exercises in asthmatic children showed that inspiratory muscle training and breathing exercises provide an improvement in mechanical efficiency in respiratory muscles, peak expiratory rate and severity variables. Similarly in the present study also showed that the breathing exercise also had an effect on peak expiratory rate and other cardiopulmonary parameters.⁸

CONCLUSION

Breathing exercises such as bunny breath, bumble bee breath and balloon breathing significantly improve the cardiopulmonary parameters in children with bronchopneumonia and can be used as an intervention in pediatric ward for support the treatment of bronchopneumonia. So the research hypothesis was accepted and the study concluded that

breathing exercises such as bunny breath, bumble bee breath and balloon breathing has significant effect on the cardio-pulmonary parameters of the children with bronchopneumonia.

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IMMUNIZATION COVERAGE AND MATERNAL PERCEPTION REGARDING IMMUNIZATION AGAINST VACCINE PREVENTABLE DISEASES IN THE COASTAL COMMUNITIES OF THIRUVANANTHAPURAM CORPORATION

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Abstract

Immunization is regarded as one of the most important achievements of public health. The purpose of the study was to assess the immunization coverage and maternal perception regarding immunization against vaccine preventable diseases in the coastal communities of Thiruvananthapuram corporation. The study was conducted in 2 phases. In phase 1 Quantitative approach was used to assess the immunization coverage, phase 2 Qualitative approach was used to assess the maternal perception regarding immunization against vaccine preventable diseases. The study was conducted among 84 participants. After obtaining informed consent and ethical clearance, researcher collected data from 84 participants by using interview schedule. For assessing maternal perception regarding immunization against vaccine preventable diseases four groups of FGD and in-depth interview were conducted in phase 2. Quantitative data were analysed using descriptive statistics. The findings were 66.7% of children were fully immunized as per national immunization schedule and 33.3% of children were partially immunized who missed at least one dose of some vaccine in the selected coastal community. Qualitative data were analysed using Braun and Clark method. Four major themes with 15 subthemes were emerged from the study. Four themes of maternal perception regarding immunization against vaccine preventable diseases were - positive attitude towards immunization, negative attitude towards immunization, adequacy of care from health care workers and the need for education.

***Keywords:** Immunization coverage, Perception, Vaccine preventable disease*

Introduction

Immunization is the process by which individual is made immune or resistant to an

infectious diseases by the administration of a vaccine. Universal immunization of children against six vaccine preventable diseases is crucial to diminish childhood mortality and morbidity

across the world. Immunization is considered as one of the most powerful and cost effective of all health interventions¹.

Immunization forms one of the most important and cost-effective strategies for the prevention of childhood sickness and is thus a basic need for all children. However, around 10 million children under the age group of 5 years die every year and over 27 million infants in the world do not get full routine immunization².

In May 1974, the WHO officially launched a global immunization programme known as Expanded Programme of Immunization (EPI) to protect all the children of the world against six vaccine preventable diseases, namely– Diphtheria, Pertussis, Tetanus, Polio, Tuberculosis and Measles by the year 2000. In India EPI was launched on January 1978³.

Today vaccination is very essential part of children health. Vaccination programme is a key step for the preventive services of children. The field of paediatric vaccination is growing and changing as new vaccines are becoming available and previous diseases are being eradicated owing to evolution of vaccine preventable diseases. Immunization is vital it protects nearly 3/4th of children against major childhood illnesses.

There are several diseases, which can be easily prevented by timely vaccination as a part of routine immunization. Every child has the right to benefit from the appropriate traditional and new life saving vaccinations. The government wants them protected from progressive diseases but many vaccines do not reach majority of infants and children. Decreased awareness, patient compliance and cost effectiveness play a major role in limiting the success of vaccine. Protection from vaccine preventable diseases is one of the most crucial rights of children. So the parents must have the primary responsibility of getting their child fully immunized and the child must not be made to suffer if the care givers are having lack of knowledge⁴.

Objectives

Phase 1

Primary objectives

- To estimate the immunization coverage among children of 0-2 years residing in coastal Communities of Thiruvananthapuram Corporation.
- To find out the socio demographic factors associated with immunization.

Phase 2

Secondary objective

- To explore the perception of mothers regarding immunization against vaccine preventable diseases

Materials and methods

The approach adopted for this study is mixed approach. This study was conducted in two phases. Phase 1 is quantitative approach(cross sectional study design), which involves assessing the immunization coverage in a selected coastal community in Thiruvananthapuram. Phase 2 is qualitative approach (descriptive design) to describe the maternal perception regarding immunization against vaccine preventable diseases. Interview schedule was used to identify the socio demographic data and immunization coverage among 84 participants were selected from selected wards of selected coastal communities.

The data collection period of the study was six weeks. The participants who met the inclusion criteria and exclusion criteria was selected . The sample size for phase 1 of the present study was 84. The researcher listed down the 5 coastal areas under Thiruvananthapuram Corporation and selected the Poonthura area randomly. In the second stage multi stage cluster sampling technique was used to select 4 wards from out of six wards under Poonthura Community Health Centre which was the accessible population. In phase 2, Purposive sampling technique was used.

Structured interview schedule was used to assess the immunization coverage which was cross validated with the immunization card. In phase 2, the data was collected by using focus group and in depth interview. The session was recorded in an audio recorder.

RESULTS

The major findings of the study as follows
In phase 1

Socio demographic data

A total of 84 children in the age group of 0-2 years were included in the study. This sample included in the study was 42 boys and 42 girl children and their mothers. Majority of mothers were unemployed (95.2%) and 33.3% were graduates. While 98.8% of the respondents had immunization card, the rest of them did not have the immunization cards with them at that time. A large proportion of the children (66.7%) had received their immunization from government establishments.

Immunization coverage among children in the age of 0-2 years

Regarding immunization status of children 66.7% of children were fully immunized as per national immunization schedule and 33.3% of children were partially immunized who missed at least one dose of some vaccine.

The analysis of vaccine specific data indicated a low level coverage for MR/DPT. 100% of the children had taken a zero dose of polio vaccine at birth. 96.4% of children took the first dose of polio vaccine, 88.1% of the children were immunized with second dose and 83.3% of the children had taken 3rd dose of polio vaccine. Among 96.4% of the children had taken IPV 1 immunization and 83.3% of the children had taken IPV 2 immunization.

Association between immunization coverage and sociodemographic factors

The study found a significant association between immunization status of children and mother's educational status and immunization centre

Maternal perception regarding immunization against vaccine preventable diseases

Based on the analysis of data, the main

themes emerged out of the study were positive attitude towards immunization, negative attitude towards immunization, adequacy of care from health care workers and need for education.
Theme 1 : Positive attitude towards immunization
Sub themes

- Vaccine is good for health
- Prevention of complications
- Improve the coverage

Theme 2: Negative attitude towards immunization
Sub themes

- Lack of family support
- History of illness
- Vaccination is harmful to the health of children

Theme 3: Adequacy of Care from health care workers
Sub themes

- Lack of care
- Positive feedback of staff
- Lack of faith
- Vaccine shortage
- Responsibilities of staff
- Experiences of staff

Theme 4: Need for education
Sub themes

- Belief against immunization
- Health education
- Lack of interest in taking immunization

DISCUSSION

The present study, 66.7% of children were fully immunized as per national immunization schedule and 33.3% of children were partially immunized who missed at least one dose of some vaccine. In the present study shows that there is a significant association between immunization status of children and the sociodemographic factors such as educational status of mothers and place in the immunization centre.

In the present study shows that there is a significant association between immunization status of children and the sociodemographic factors such as educational status of mothers and place of the immunization centre (P value is,

0.043,0.036 i.e. < 0.05). These study findings are supported by a study done by Kannan revealed that higher literacy of parents was associated with full immunization of the child (P<0.01).

The present study, 66.7% of children were fully immunized as per national immunization schedule and 33.3 % of children were partially immunized who missed at least one dose of some vaccine. The findings are supported by another study done by Zida Compaore et. al in Western Africa, which shows that complete immunization coverage was 69.3% and the factors associated with incomplete immunization were absence of immunization card, level of education, and the level of health structure in the organization.

CONCLUSION

Immunization is a proven tool for controlling and eliminating life threatening infectious diseases and is estimated to avert between 2 and 3 million deaths in each year. Immunizations are often widely stated as less risky and an easier way to become immune to a particular disease than risking a milder form of the disease itself.

Based on the study findings, the following conclusion were drawn :-Among 66.7% of children were fully immunized as per national immunization schedule and 33.3 % of children were partially immunized who missed at least one dose of some vaccine. There was significant association between immunization status of children and the sociodemographic factors such as educational status of mothers and place of the immunization

centre (P value is, 0.043,0.036 i.e. < 0.05). Based on the analysis of data , the main themes emerged out of the study were positive attitude towards immunization, negative attitude towards immunization, adequacy of care from health care workers and need for education.

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MENSTRUAL HYGIENE PRACTICES AND MENSTRUAL PROBLEMS AMONG ADOLESCENT GIRLS IN THIRUVANANTHAPURAM CORPORATION

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Abstract

Menstruation is one of the most significant events in a female's life. With menarche, nature welcomes the little girl into the world of womanhood, accelerating her growth- physical mental and emotional. This regular cycle stamps her identity as a woman. Menstruation is surrounded by various psychological and religious barriers due to lack of knowledge about the scientific process of menstruation. Although menstruation is a natural process, it is linked with several perceptions and practices within the community, which sometimes may result in adverse health outcomes. This study was conducted with the objectives to assess the menstrual hygiene practices and menstrual problems of adolescent girls in Thiruvananthapuram Corporation and to determine its association with selected socio-demographic variables. The study was done by quantitative research approach and descriptive cross sectional design. Data was collected from adolescent girls of the selected schools and analysed using descriptive and inferential statistics. After the data collection the girls were given instructional module on menstruation. From the study it was observed that 54.5% of participants had good hygienic practices, 44.7% had average practices and 0.8% had poor practices during menstruation. It was also observed from the current study that 64.9% of the participants had abdominal discomfort, 34.8% with back ache, and 23.3% with pain in legs. In this study, 41% of the girls had no psychological problems during menstruation, 36.2% had single psychological problems and 22.8% had multiple psychological problems. Also the current study findings revealed 43.7% of participants had restriction in spiritual activities. The findings revealed that menstrual problems and menstrual hygiene practices are significantly associated with selected demographic variables

Key words: *Menstruation problems, menstrual hygiene practices, adolescent girls*

INTRODUCTION

Human life is like a flower, it blossoms and eventually withers. When the flowers begin to bloom, their sweet smiling fragrances attract others until it fades away and falls. Human life has many phases; the phase that glows and stands out predominantly is the period of adolescence.

Menstruation is one of the most significant events in a female's life. With menarche nature welcomes the little girl into the world of womanhood, accelerating her growth- physical, mental and emotional. This regular cycle stamps her identity as a woman. However, in most parts of the world, it remains a taboo and is rarely talked. Cultural practices and taboos around menstruation negatively impact the lives of adolescent girls and women and also reinforce gender inequities and exclusion.^[1]

Menstruation (a period) is an exceptional phenomenon that the nature has planned for women. It is not just a small term but a major stage where a woman undergoes certain reproductive changes from onset of menstruation (menarche) till menopause. Adolescence is the stage of physical, psychological, and reproductive development that generally occurs during the period from puberty to legal adulthood. The World Health Organization defines adolescence as individuals between 10 and 19 years of age.^[2]

Every May 28, nonprofit organizations, government agencies, the private sector, the media, and individuals come together to celebrate Menstrual Hygiene Day (MH Day) and advocate for the importance of good menstrual hygiene management (MHM). This year, MH Day recognizes that periods do not stop for pandemics and will continue to drive home the idea **It's Time for Action**. This theme highlights the urgency for the collective work needed to both change

the negative social norms surrounding menstruation and also catalyze progress toward empowering women and girls to unlock their educational and economic opportunities.^[3]

Objectives

Primary Objectives

1. Find out the practices of menstrual hygiene among adolescent girls in Thiruvananthapuram Corporation.
2. Assess the menstrual problems among adolescent girls in Thiruvananthapuram Corporation.

Secondary Objectives

1. Determine the association between selected demographic variables and menstrual hygiene practices.
2. Determine the association between selected demographic variables and menstrual problems.
3. Prepare an instructional module for adolescent girls regarding menstrual hygiene practices and management of menstrual problems.

Materials and methods

The research approach adopted for this study was quantitative and the research design selected for the present study was descriptive design- cross sectional study. The study was conducted in 2 government, 2 aided and 2 private higher secondary schools in Thiruvananthapuram Corporation. Selection of schools was done randomly from a list of 20 higher secondary government, aided and private schools in Thiruvananthapuram Corporation. 2 government, 2 aided and 2 private schools were selected. Each selected school was stratified by their sections- upper primary, high school and higher secondary. For selection of representative numbers of

students, the ratio of students in the respective type was considered. By cluster sampling proportionate number of girls was selected from each stratum. For this study the technique used was questionnaire prepared by the researcher and self reported by the participants:

After obtaining formal permission for data collection from Institutional Research Committee, Human Ethics Committee, Directorate of Public Instruction and Directorate of Higher Secondary Education and Principals of the respective schools the study was conducted from January 6th to February 15th for a 6 week period.

The investigator introduced her to the subjects and explained the purpose of the study. Participant informant sheet, assent, informed consent and parental consent were given and informed to get it signed by the participants and parents. The next day after getting the consents signed those who fulfilled the inclusion criteria were selected for the study. Questionnaire was given to collect the sociodemographic data, problems on menstruation and menstrual hygienic practices. Confidentiality was ensured throughout the study. After the data collection the participants were given instructional module on healthy menstrual hygiene practices and management of menstrual problems. Teaching sessions were also given with help of power point presentation.

The data collected were analysed using descriptive and inferential statistics. Quantitative variables were expressed as mean and standard deviation. Qualitative variables were expressed as proportion. Relationship between qualitative variables was assessed by Chi-square test. A p-

value <0.05 was considered statistically significant. Data analysis was performed by using SPSS 22.

Description of the tool

Questionnaire containing 4 sections:

Section 1: Socio-demographic data-containing 11 questions to assess the sociodemographic status of the participants.

Section 2: Pattern of menstruation – containing 6 questions regarding pattern of menstruation.

Section 3: Problems of menstruation-consisting of 5 questions in physical problems, 1 question in psychological problem, 3 questions in social restrictions during menstruation and 1 question to assess the effect of menstruation on activities of daily living.

Section 4: Menstrual hygiene practices-consisting of 8 questions regarding menstrual hygiene practices. Each correct response was given score 1 and for wrong response score was given 0. Total score was given as,

>75%- Good

50-75%- Average

<50%- Poor

RESULTS

The study revealed 54.5% of adolescent girls had good hygienic practices, 44.7% had average practices and 0.8% of girls had poor hygienic practices during menstruation. Overall there were only some sociodemographic variables having significant association with menstrual hygienic practices and menstrual problems. Most of the variables were having no significant association.

Table 1 Association of psychological problems with selected demographic variables

(n=615)

Socio-Demographic Variable	Category	Psychological problems				Total		χ^2	df	p
		Absent n	%	Present n	%	n	%			
Class	Up	89	43.4	116	56.6	205	100			
	High school	137	66.8	68	33.2	205	100	30.98*	2	<0.001
	Higher secondary	137	66.8	68	33.2	205	100			
Religion	Hindu	161	40	242	60	403	100			
	Christian	31	38.8	49	61.3	80	100	1.434	2	0.488
	Muslim	60	45.5	72	54.5	132	100			
Education of mother	Primary/High school	68	38.4	109	61.6	177	100			
	Higher secondary	56	39.4	86	60.6	142	100			
	Graduate/Diploma	86	43.2	113	56.8	199	100	1.247	3	0.742
	Postgraduate /Professional	42	43.3	55	56.7	97	100			
Occupation of mother	Home maker	129	42	178	58	307	100			
	Self employed/Coolie	41	42.7	55	57.3	96	100	0.72	2	0.698
	Salaried	82	38.7	130	61.3	212	100			
Occupation of father	Unemployed/ Coolie	84	42.2	115	57.8	199	100			
	Self employed	61	40.9	88	59.1	149	100	0.215	2	0.898
	Salaried	107	40.1	160	59.9	267	100			
Place of domicile	Rural	86	43	114	57	200	100			
	Urban	166	40	249	60	415	100	0.502	1	0.479
Prior information	Yes	196	42.6	264	57.4	460	100			
	No	56	36.1	99	63.9	155	100	2.013	1	0.156

*Significant at 0.05

From the table 1, it is clear that there was statistically significant association between class section and psychological problems during menstruation.

Discussion

The major findings of the present study were:

The present study revealed 67.2% of the participants were in the age group of <15 yrs and 32.8% are in the age limit >15 yrs. In a similar study in 536 female students, the

participants were 57.6% in the age group of 16-19 years and 42.4% in the age group of 10-15 years.^[4]

Study revealed that 49.6% of participants were having prior information regarding menstruation from mother. This was similar to another study where 37.5% cases mother was the

key informant. This shows the high literacy levels of Kerala mothers which had buried the inhibitions of a mother to talk to her daughter regarding menarche and the significance of menstrual hygiene. This will play a long way in maintaining a healthy reproductive tract for each and every girl child who, after she becomes a mother, percolates the healthy message to her female offspring. [5] Role of teachers was observed negligible in imparting education about various aspects of menstruation.

The current study findings revealed that the mean age of menarche was found to be 11.5 ± 1.8 yrs which was essentially similar to a study in Turkey where mean age of the subjects at menarche was 12.8 ± 1.3 years with a range of 9-17 years. [6]

It was observed from the current study that 64.9% of the participants had abdominal discomfort, 34.8% with back ache, and 23.3% with pain in legs. A cross-sectional study conducted by John at St. Theresa's Girl's Higher Secondary School, Pathanamthitta district on menstrual problems among adolescent girls, showed that 70.1 % of adolescent had problems related to menstruation, of which dysmenorrhea was the major problem (88.8%) and premenstrual syndromes were present in 45.8%. The commonest premenstrual syndromes were headache (42.5%) and irritability (40%). [7] In this study, 54.5% of participants had good hygienic practices, 44.7% had average practices. Contrary to this study, a study in Government School of Shimla, Himachal Pradesh composite practice scores showed that 19%, 69%, and 12% samples had poor, fair, and good score of practices regarding menstrual hygiene,

respectively. [8] It was observed from the present study that there was no significant statistical association between physical problems during menstruation and sociodemographic data of the participants. A contradictory community based cross sectional study among school going adolescent girls in Nagpur, India revealed that majority (71.83%) of the girls had one problem related to menstrual cycles and there was a significant difference in proportion of menstrual problems in rural and urban girls ($p < 0.01$) [9].

In this study the participants from higher secondary have more good hygienic practices. In a study done by Kansal *et al.*, in Varanasi significant association was observed between menstrual hygiene practices and subject's literacy status, religion, socioeconomic status, and mother's literacy status [10].

Conclusion

From the study the investigator found the distribution of menstrual problems and menstruation hygienic practices and the association between the selected demographic variables and menstrual problem and hygienic practices. The present study has got implications on various aspects of nursing. Moreover the nurse must motivate girls to follow healthy practices in day to day life. Every school should provide counselling session regarding menstruation, menstrual hygiene and menstrual abnormalities. In the field of research the present study helps to utilize the findings and disseminate the knowledge in the field of work.

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QUALITY OF LIFE AMONG ELDERLY

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Abstract

Ageing refers to normal progressive and irreversible biological changes that occur over an individual's lifespan. Quality of life (QOL) of the elderly has become relevant with the de-mographic shift toward an aging society. The objectives of the study were, to assess the quality of life among elderly attending geriatric clinic in a tertiary care centre and find out factors associated with QOL. The research approach adopted for the study was quantitative approach and research design was cross sectional design. The theoretical frame work for the present study was Betty Neumann's System model. The present study was conducted among 233 elderly people belonged to the age group of 60 years and above, attended geriatric clinic in Medical College Hospital, Thiruvananthapuram. The consecutive cases were selected for the study. A structured interview schedule was used to collect the data and assessed QOL by using WHO QOL BREF. Quality of life was described under four domains namely physical domain, psychological domain, social domain and environmental. The collected data were analysed using descriptive and inferential statistics. The result revealed that overall quality of life was average (58.74±9.32). The mean score in environmental domain was high (69.3±14.1) and social domain was low (46.9±14.5). Therefore best quality of life was in the environmental domain and worst quality of life was in social domain. The present study shows significant association between quality of life and present occupation status, financial status, insurance facility, marital status.

Key words: Quality of life, Elderly, BREF

INTRODUCTION

Ageing is a natural process that begins at birth and progress throughout one's life and ends at death. The world population is rapidly ageing.¹ United Nations (1980) considers 60 years as the age of transition to the elderly age group. At global level, Quality of life (QOL) among elderly is an important area of concern which reflects

the health status and well-being of this vulnerable population.² QOL is a broad concept covering the individual's physical health, mental state, level of independence, social relationships, spiritual beliefs, and the environment. Ageing, along with the functional decline, economic dependence, social cut off and autonomy of young generation, compromises quality of life. It is important to

highlight the medical and psychosocial problems that are being faced by the elderly people in India and strategies for bringing about an improvement in their quality of life. The condition of elderly is deteriorating as a result of fast eroding traditional family system coupled with rapid modernization and urbanization.³In developing countries, demographic transition results in increasing life expectancy and increase in proportion of elderly population in near future.⁴

Statement of the problem

A descriptive study to assess Quality of life among elderly attending the geriatric clinic in a Tertiary Care Centre, Thiruvananthapuram.

Objectives of the study

- Assess the quality of life among elderly attending geriatric clinic in Medical College Hospital, Thiruvananthapuram
- Find out factors associated with quality of life among elderly.

Materials and methods

The research design adopted for the study was descriptive design to estimate the quality of life of elderly attending geriatric clinic in a tertiary care centre. A Cross-sectional survey approach was adopted to collect information. A hospital based study was conducted in geriatric clinic at Medical College Hospital Trivandrum. All the patients attending the geriatric clinic during the study period was selected. The data collection was started after getting permission from Research committee, Institutional Ethics committee of Government College of Nursing Thiruvananthapuram. Setting permission was obtained from Medical Superintendent, Medical College, Thiruvananthapuram. The period of data collection was 6 weeks. The duration of data collection was 07.01.2019 to 15.02.2019. The baseline data was obtained using Tool 1; sociodemographic and clinical data. Quality of life was assessed using WHOQOL. The purpose of the study was explained to the participants and consent to participate in this study were obtained. A good rapport was established before administering questionnaire. The technique used for collecting information include semi structured interview.

RESULTS

In the present study overall quality of life was average. Out of total participants majority had (76%) average quality of life, 2.6% had good quality of life and 21.5% had poor quality of life. The mean score of overall quality of life was 58.74 ± 9.32 . Out of 233 participants 25% had an overall mean score less than or equal to 53.00; 50% had an overall mean score less than or equal to 59.5; 75% had less than or equal to 65.75. The overall QOL score of the participants in the present study as a minimum score of 36.00 and maximum score of 80.00.

DISCUSSION

In the present study overall quality of life was found to be average. Out of total participants majority (76%) had average quality of life, 2.6% had good quality of life and 21.5% had poor quality of life. The mean score of overall quality of life was 58.74 ± 9.32 . Mean scores of the domains were physical (63.7 ± 12.7); psychological (55.2 ± 13.7); social (46.9 ± 14.5); environmental (69.3 ± 14.1).

In a similar cross-sectional design study aimed to describe quality of life and examine factors related to quality of life among older adults in Bangladesh¹⁶ 90.70% had a moderate level of QOL. The highest percentage of the participants perceived moderate levels of QOL in the following domains: physical (75.4%), psychological (84.6%), social (80%), and environmental (82.1%).

A cross-sectional study among 203 residents aged 60 years or more in eight randomly selected Elderly Homes in Kuala Lumpur¹⁷ revealed the mean (Standard deviation) for the physical domain was 14.3 (± 2.7), 13.7 (± 2.5) for the psychological domain, 10.8 (± 3.4) for the social domain, and 13.0 (± 2.5) for the environment domain. Factors significantly associated with quality of life included age, gender, level of education, economic status, outdoor leisure activity, physical activity, duration of residence, type of accommodation, co-morbidities, and social support.

CONCLUSION

In the present study overall quality of life

among elderly attending geriatric clinic was found average. Out of total participants majority (76%) had average quality of life, 2.6% had good quality of life and 21.5% had poor quality of life. The present study showed that there was significant association between quality of life with gender, place of residence, present occupational status, financial status, availability of pension, type of family and number of children.

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KNOWLEDGE, ATTITUDE AND PERCEPTIONS REGARDING CARE OF ELDERLY AMONG ADULTS IN SELECTED WARDS OF SELECTED PRIMARY HEALTH CENTRE, THIRUVANANTHAPURAM

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Abstract

Elderly people desire a life with good health, dignity, economic independence and finally a peaceful death. The purpose of the study was to assess the knowledge, attitude and perception regarding care of elderly among adults in selected wards of selected health centre, Thiruvananthapuram.

The study was conducted in 2 phases. In phase 1, knowledge and attitude regarding care of elderly were assessed using quantitative approach. A total of 325 participants whose family having atleast 1 elderly either their parents or others were selected using multi stage cluster sampling and are given self reporting questionnaire to assess knowledge and attitude regarding care of elderly. In phase 2, a qualitative approach was used to assess the perceptions regarding care of elderly. Four Focus group discussions with 7-8 participants were selected using purposive sampling and are conducted to assess perceptions regarding care of elderly among adults. Quantitative data were analysed using descriptive statistics. The findings were 49.5% of the participants had poor knowledge, 28.0% of them had moderate knowledge and 22.5% of them had good knowledge on care of elderly; 87.7% of the participants had good attitude, 11.7% of them had average attitude and 0.6% of them had poor attitude regarding care of elderly. Qualitative data were analysed using Braun and Clark method. Four themes of perceptions regarding care of elderly: need to care elderly, care of elderly at home, care of elderly staying away from children/relatives, problems that encountered while caring elderly were emerged from the data. The study throws light on the need to improve knowledge of adults to render effective care to the elderly people.

Keywords: Knowledge on care of elderly; Attitude on care of elderly; Perceptions on care of elderly; Care of elderly

INTRODUCTION

People world wide are living longer. The pace of population ageing around the world is also increasing dramatically.¹ India is the second most populous country in the world by covering one-fifth of world's population.² Population ageing is the most significant result of the process known as demographic transition. It involves a shift from high mortality/high fertility to a low mortality/low fertility and consequently an increased proportion of older people in the total population.³ India is undergoing such a demographic transition and is moving from middle transitional stage to the late transitional stage.⁴ India is a country where the traditional norms and values also laid stress on showing respect and providing care for the elderly. But in the last few decades due to modernization, the elderly does not enjoy the same status as they enjoyed in the past.⁵

According to data from World Population Prospects: the 2019 Revision, by 2050, one in six people in the world will be over age 65 (16%), up from one in 11 in 2019 (9%).⁶

According to Population Census 2011 there are nearly 104 million elderly persons (aged 60 years or above) in India; 53 million females and 51 million males.⁷

The demographic trend shows that Kerala is currently passing through the most critical stage of demographic transition as a result of fertility and mortality changes, particularly steep in the 70s and 80s and the consequent age structural transition. Kerala is aging faster than the rest of India. Its 60 plus population, 5.1% of the total was just below the national 5.6%. Since 1980, Kerala has overtaken the rest and the 2001 comparison is 10.2 per cent to 7.5; by 2011, 11.9 per cent of the population is already past 60 years.⁸

The old age dependency ratio shows an increasing trend in Kerala and is highest among

Indian states. It increased from 166 in 2001 to 196 in 2011. This implies that the responsibility of supporting the larger section of old age people is higher on the working age population, in terms of shelter, daily living, health expenditure and care giving in Kerala.⁹

The exact number of old age homes in India cannot be estimated for two reasons. Neither the government of India nor the state governments keeps an updated list of old age homes in their domain. Even when some states claim they have a list, the fact of large scale proliferation of old age homes would make the list incomplete.¹⁰

In 2011 Help Age India came out with a list of old age homes in India. This was a revision of their earlier list published in 2009. But the list also contains names of so many homes that did not reply to their questionnaire so that one is not sure whether they do exist at present.¹⁰

A cross-sectional study on knowledge and attitude regarding care of elderly among nursing students: an Indian perspective, carried out at National Institute of Nursing Education, PGIMER, Chandigarh, India revealed that around two third of the participants were in the good category of knowledge score.¹¹

A study in selected area in Pune city to assess the knowledge and attitude of family members regarding care of senior citizen, showed that 91% of family members have positive attitude towards elderly people and 9% of family members have negative attitude.¹²

A qualitative study in Iran to identify the challenges of elderly care, yielded five major challenges, including policy making, access, technical infrastructure, integrity and coordination, and health-based care services.¹³

A study on public awareness and perception on care of elderly among Funtua residents in Kastina state, North-west Nigeria revealed that 90 percent of participants have relatively good knowledge, with high positive attitudinal

predisposition towards and preference to care for their aged people in their home rather than to be nursed in institutions such as nursing homes.¹⁴

Elderly people may become sick, weak and frail. With their conditions come the need for more attention, more care, more love, more understanding and more importantly, quality elderly care.¹⁵

So for this all that needed are not only the knowledge regarding it but also the attitude towards it. Along with these two aspects perceptions regarding the care of elderly by the care givers are also important.

Objectives of the study

Phase 1

1. To assess the knowledge regarding care of elderly among adults.
2. To assess the attitude regarding care of elderly among adults.

Phase 2

3. To describe the perceptions regarding care of elderly among adults.

METHODOLOGY

The approach adopted for this study is mixed approach—sequential explanatory method. This study is conducted in two phases. Phase 1 is quantitative approach, which involves assessing knowledge and attitude of the adults regarding care of elderly of selected wards of a selected health centre, Thiruvananthapuram. Phase 2 is qualitative approach to describe the perceptions regarding care of elderly among adults of selected wards of a selected health centre, Thiruvananthapuram. The research design used in this study is descriptive design for both phase 1 and phase 2.

The study was conducted in selected wards of selected Primary Health Centre, Thiruvananthapuram. In phase 1 and phase 2, the sample consists of the adults of selected wards of selected Primary Health Centre, Thiruvananthapuram.

The sample size for phase 1 of the present study was 325 adults residing in selected wards of selected health centre based on inclusion criteria. From each ward, 65 subjects were selected for the study. In phase 2, sample size was fixed based on data redundancy.

In phase 1, the sampling technique used was multi stage cluster sampling. In phase 2, purposive sampling technique was used.

A self reporting questionnaire was used to assess the knowledge and a likert five-point rating scale to assess the attitude of adults regarding care of elderly. In phase 2, the data was collected using 4 focus group discussions with 7-8 participants. The session was recorded in an audio recorder.

RESULTS

Distribution of adults regarding knowledge on care of elderly

- Among 325 subjects, 49.5% of the adults had poor knowledge, 28.0% of the adults had average knowledge and 22.5% of the adults had good knowledge on care of elderly.
- Among 325 participants, 68.3% of adults had poor knowledge, 18.8% of them had average knowledge and 12.9% of the adults had good knowledge regarding elderly problems.
- It was observed that 39.7% of the adults had poor knowledge, 32.3% had good knowledge and 28.0% of the adults had average knowledge on healthy behaviour.
- Out of 325 participants, 46.2 % had poor knowledge, 28.9% of the adults had average knowledge and 24.9 % of the adults had good knowledge on diet and exercise
- Among 325 participants ,56.9 % had poor knowledge ,28.9% of the adults had average knowledge and 14.2% of the adults had good knowledge on modifications needed at home for elderly.

- It was observed that 47.0% of the adults had poor knowledge, 18.5% of the adults had average knowledge and 34.5 % of the adults had good knowledge on care of elderly living alone.
- Out of 325 participants, 55.7% of the adults had poor knowledge, 27.7% of the adults had average knowledge and 16.6 % of the adults had good knowledge on care of elderly with sensory disturbances
- Out of 325 participants, 69.5% of the adults had poor knowledge, 28.3 % of the adults had average knowledge and 2.2 % of the adults had good knowledge on administering medications for elderly
- It was observed that 46.2 % of the adults had poor knowledge , 33.8 % of the adults had average knowledge and 20.0% of the adults had good knowledge on care of bed-ridden elderly
- Among 325 participants, 68.3% of the adults had poor knowledge, 23.7% of the adults had average knowledge and 8.0% of the adults had good knowledge on welfare services for elderly

Distribution of adults regarding attitude towards care of elderly

Among 325 participants, 87.7% of the adults had good attitude, 11.7% of the adults had average attitude and 0.6% of the adults had poor attitude regarding care of elderly

Perceptions regarding care of elderly among adults

Perceptions regarding care of elderly among adults are discussed under certain themes and subthemes.

Theme 1: Need to care elderly Sub themes

- Problems of elderly
- Situational Changes
- Need changes

Theme 2: Care of elderly staying away from children/relatives

Sub themes

- Maintaining contact
- Alternative care
- Supportive care

Theme 3: Care of elderly at home Sub themes

- Communication
- Meeting needs
- Family involvement
- Dietary management
- Role of new generation

Theme 4: Problems encountered while caring elderly.

Sub themes

- Life style changes
- Personal factors of elderly
- Attitude of adults
- Changes in health care

DISCUSSION

The present study was focused to assess the knowledge, attitude and perception regarding care of elderly among adults of selected wards of selected health centre, Thiruvananthapuram.

It was observed that 69.5% of the participants had poor knowledge, 28.3% of the participants had moderate knowledge and 2.2% of the participants had good knowledge regarding administering medications for elderly. The finding was supported by a study conducted in Charlotte, USA regarding medication administration hassles reported by family caregivers of dependent elderly persons. Twenty-three family caregivers completed semi structured, face-to-face interviews to capture the shared and idiosyncratic experiences of individuals responsible for all aspects of

medication administration regimens for elderly, dependent family members. Based on 122 separate accounts, three categories of medication administration hassles were identified. The categories (with the percentage of all accounts represented by the category) include scheduling logistics (29.5%), administration procedures (31.9%) and safety issues (38.6%).¹⁶

In the present study, 46.2% of the participants had poor knowledge, 28.9% of the participants had average knowledge on diet and exercise of elderly. This finding is supported by a quasi-experimental study conducted in Qassim region which revealed 73.4% of the care givers got poor knowledge scores prior attending the educational program regarding exercises, 89.1% of the care givers got poor knowledge regarding nutrition in the pre test.¹⁷

In the present study, findings on perceptions regarding care of elderly among adults showed that changes in health care like high cost services, categorizing elderly on the basis of income, reduction in services are grouped under one of the themes, problems encountered while caring elderly. These findings are supported by another qualitative study conducted in Iran which revealed challenges in integrity and coordination between different levels of health system as a theme, covering, lack of well-defined referral systems, inaccessibility to specialized services to elderly, incurrent situation of elderly care in Iran.¹⁸

It was observed that situational changes like death of their peer, separation from children were grouped under the theme need to care elderly. These findings are supported by another qualitative study which revealed many participants had suffered a number of losses or challenges in life such as the death of close family members, illiteracy, estranged adult children, adult children with special needs, and loss of limbs.¹⁹

The results have implications for nurses in facilitating constructive changes in knowledge, attitude and perceptions of adults.

CONCLUSION

The researcher identified that the knowledge regarding care of elderly was low among the studied population, also it need to be increased. Therefore, there is an urgent need to evolve strategies to educate adults and growing children regarding care to the

elderly. The attitude towards care of elderly among studied population was higher .The perceptions regarding care of elderly is described under four themes , covers the major domains of caring the elderly. So the perception and attitude regarding care of elderly among adults are good and satisfactory.

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MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS-C)

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Introduction

Coronavirus disease-2019 (COVID-19), which started in Wuhan, China, in December 2019 and declared a worldwide pandemic on March 11, 2020, is a novel infectious disease that causes respiratory illness and death. Pediatric COVID-19 accounts for a small percentage of patients and is often milder than that in adults; however, it can progress to severe disease in some cases. Even neonates can suffer from COVID-19, and children may spread the disease in the community.¹ Multisystem inflammatory syndrome in children, a rare but serious complication associated with COVID-19. MIS-C is considered as a group of signs and symptoms, not a disease and much about it is unknown, including its cause and risk factors. Multisystem inflammatory syndrome in children (MIS-C), a condition characterized by fever, inflammation, and multiorgan dysfunction that manifests late in the course of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, and to provide recommendations for children with hyperinflammation during coronavirus disease 2019 (COVID-19), the acute, infectious phase of SARS-CoV-2 infection.²

Preliminary Definition

Most children who become infected with the COVID-19 virus have only a mild illness. But in

children who go on to develop MIS-C, some organs and tissues — such as the heart, lungs, blood vessels, kidneys, digestive system, brain, skin or eyes — become severely inflamed. Signs and symptoms depend on which areas of the body are affected.³

Children and adolescents 0–19 years of age with fever > 3 days AND two of the following:

- Rash or bilateral non-purulent conjunctivitis or muco-cutaneous inflammation signs (oral, hands or feet).
- Hypotension or shock.
- Features of myocardial dysfunction, pericarditis, valvulitis, or coronary abnormalities (including ECHO findings or elevated Troponin/NT-proBNP),
- Evidence of coagulopathy (by PT, PTT, elevated d-Dimers).
- Acute gastrointestinal problems (diarrhoea, vomiting, or abdominal pain).

AND Elevated markers of inflammation such as ESR, C-reactive protein, or procalcitonin.

AND No other obvious microbial cause of inflammation, including bacterial sepsis, staphylococcal or streptococcal shock syndromes.

AND Evidence of COVID-19 (RT-PCR,

antigen test or serology positive), or likely contact with patients with COVID-19.⁴

Children may experience an acute cardiac decompensation caused by severe inflammatory state after SARS-CoV-2 infection (multisystem inflammatory syndrome in children). Treatment with immunoglobulin appears to be associated with recovery of left ventricular systolic function.⁴

What Is New ?

- Multisystem inflammatory syndrome in children shares similarities with atypical Kawasaki disease, but prominent clinical signs are largely different.
- Myocardial involvement with acute heart failure is likely due to myocardial stunning or edema rather than to inflammatory myocardial damage.⁴

What Are the Clinical Implications?

- Whereas the initial presentation may be severe with some children requiring mechanical circulatory and respiratory assistance, rapid recovery with the use of immunoglobulin and steroids is currently observed.
- Additional study is needed to determine the full spectrum of illness and whether long-term cardiac complications may arise.⁴

The case definition for MIS-C is:

- An individual aged <21 years presenting with fever*, laboratory evidence of inflammation**, and evidence of clinically severe illness requiring hospitalization, with multisystem (≥ 2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological); AND
- No alternative plausible diagnoses; AND
- Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or exposure to a suspected or confirmed COVID-19 case within the 4 weeks prior to the onset of symptoms.

*Fever $\geq 38.0^{\circ}\text{C}$ for ≥ 24 hours, or report of subjective fever lasting ≥ 24 hours
**Including, but not limited to, one or more of the following: an elevated C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fibrinogen, procalcitonin, d-dimer, ferritin, lactic acid dehydrogenase (LDH), or interleukin 6 (IL-6), elevated neutrophils, reduced lymphocytes and low albumin.⁵

Pathogenesis

Recent evidence suggests that compared to adults, children likely have similar viral loads in their nasopharynx, similar secondary infections rates, and can spread the virus to others⁶

The SARS-CoV-2 virus utilizes Angiotensin Converting Enzyme 2 (ACE2) receptors as its cell surface receptor, similar to the SARS 2002-3 virus. ACE2 is expressed in highly biciliate epithelial cells in the human lungs and this receptor allows the virus to attach to the cell.⁷

The ACE2 receptor is also expressed in the intestines, potentially accounting for the gastrointestinal symptoms that commonly occur in the early stage of the illness. Severe COVID-19 disease is characterized by three phases: the first being the viral phase; the second being the cytokine storm; and the third encompassing acute respiratory distress syndrome (ARDS), impaired cardiac function and death⁸

The cytokine storm appears to be driven by a dysregulated host immune response [8] The profile of the cytokine storm associated with severe COVID-19 disease is similar to that of secondary hemophagocytic lymphohistiocytosis (HLH), which is a rare complication of other viral infections (3.7-4.3%).⁸Secondary HLH is characterized by fulminant and fatal hypercytokinemia with multiorgan failure. In severe infection, lower peripheral lymphocyte counts (CD4 and CD8 T cells), higher interleukin (IL) levels (IL-6 and IL-10), decreased interferon-gamma expression in CD4+ T cells and higher D-dimer and fibrin degradation products (FDP) levels, leading to increased thrombosis and multiorgan injury has been described.⁸

What are the common signs and symptoms of MIS-C?

Signs and symptoms include persistent fever, inflammation (based on laboratory test results), and evidence of organ dysfunction or shock.⁹

Although different presentations have been described, common symptoms include:

- Kawasaki disease-like features: conjunctivitis, red eyes; red or swollen hands and feet; rash; red cracked lips, swollen glands. In some children, coronary artery enlargement and/or aneurysms have been described. Some children presenting with Kawasaki disease-like syndrome have been noted to have a broader age range and presentation with more gastrointestinal (abdominal pain or diarrhea) and neurologic (headaches/meningitis) manifestations.
- Gastrointestinal symptoms such as abdominal pain, diarrhea, nausea/vomiting (patients have presented with colitis, hepatitis, and questionable appendicitis).
- Toxic shock syndrome-like features with hemodynamic instability and poor heart function. Cytokine storm/macrophage activation or hyper inflammatory features.
- Thrombosis or acute kidney injury.
- Shortness of breath suggestive of congestive heart failure or pulmonary embolism.
- Respiratory symptoms typically reported in adults with COVID-19 may not be present in pediatric patients with MIS-C.⁹

Investigations

Common laboratory findings in case reports have included:

- An abnormal level of inflammatory markers in the blood, including elevated ESR/CRP and ferritin, LDH.
- Lymphopenia <1000, thrombocytopenia <150,000, neutrophilia.

Elevated B-type natriuretic peptide (BNP) or NT-pro BNP, hyponatremia, elevated D-dimers.⁹

In Out Patient Department & Emergency Setting

- Evaluate a child with persistent fever (e"3 days) who is moderately to severely ill with clinical signs of organ dysfunction (e.g. gastrointestinal, respiratory, cardiac, skin, or neurologic).
- Initial evaluation should include measurement of vital signs, assessment of perfusion and oxygen saturation. Early consultation and coordination with the nearest pediatric infectious disease and rheumatology specialist and pediatric referral center for optimal testing and management should be considered.
- Laboratory screening for systemic inflammation may be considered and initial lab screenings may include complete blood cell count (CBC) with differential, urine analysis, ESR, and CRP, with the addition of ferritin, LDH, comprehensive metabolic panel, pro-BNP, troponin, and fibrinogen depending on initial clinical suspicion and/or evidence of inflammation on initial lab screening.

None of these laboratory studies is specific for the diagnosis of MIS-C, so even if there is evidence of significant systemic inflammation like that in pyelonephritis, appendicitis etc.⁹

In hospitalized children

Child with fever, abdominal pain, diarrhea, and/or organ dysfunction in whom MIS-C is suspected should be cared for in a hospital with tertiary pediatric/cardiac intensive care units. Following expanded laboratory and cardiac workup that may be needed:

- Chest radiograph, EKG, and troponin. If any of these or physical examination is abnormal, then consult with pediatric cardiology and consider additional diagnostic testing for myocardial injury (echocardiogram and/or cardiac MRI).
- Expanded laboratory tests including pro-BNP, triglycerides, creatine kinase, amylase, blood and urine culture, D-dimer,

prothrombin time/partial thromboplastin time (PT/PTT), INR, CRP, ferritin, LDH, comprehensive metabolic panel, and fibrinogen, if not already conducted.

- In all cases, COVID-19 testing should be performed with RT-PCR assay and serologic testing. Later serology may be needed if all negative initially. Serologic tests must be sent prior to administration of intravenous immunoglobulin (IVIG).⁹

Treatment

Treatments have consisted primarily of supportive care and directed care against the underlying inflammatory process. Supportive measures have included:

- fluid resuscitation;

- inotropic support;
- respiratory support; and
- in rare cases, extracorporeal membranous oxygenation (ECMO).

Anti-inflammatory measures have included the frequent use of IVIG and steroids. The use of other anti-inflammatory medications and the use of anti-coagulation treatments have been variable. Aspirin has commonly been used due to concerns for coronary artery involvement, and antibiotics are routinely used to treat potential sepsis while awaiting bacterial cultures. Thrombotic prophylaxis is often used given the hypercoagulable state typically associated with MIS-C.⁹

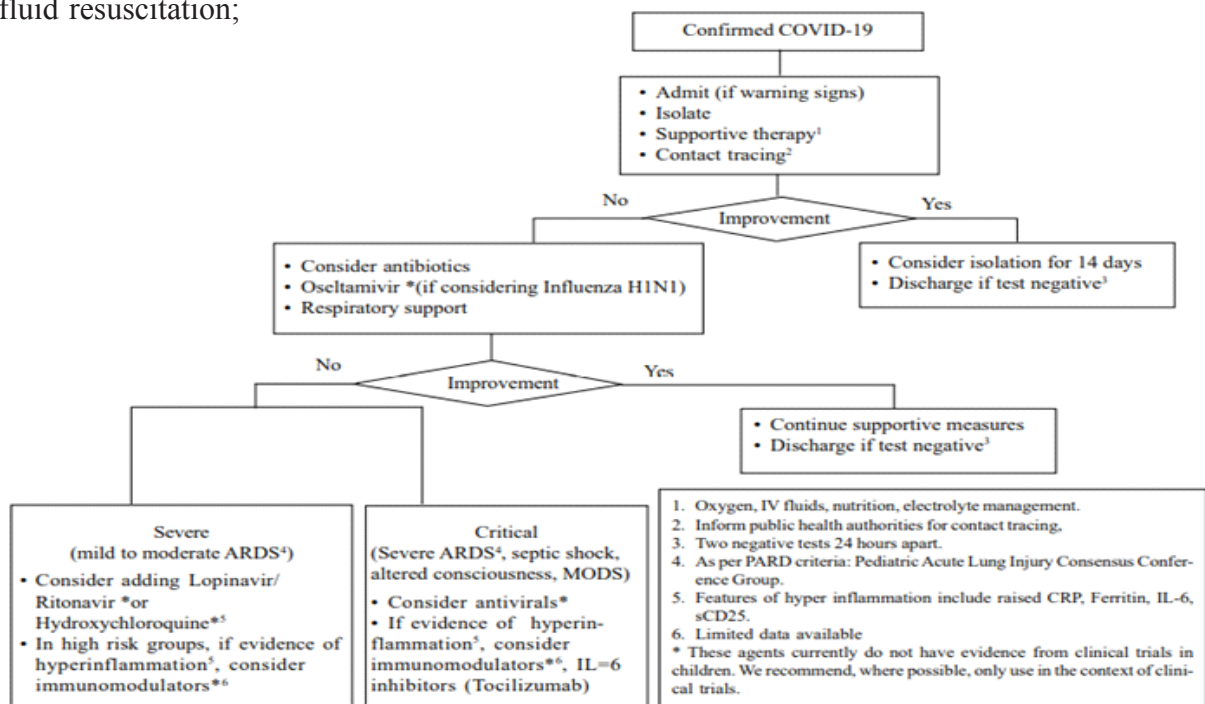


Fig. 2 Suggested algorithm for case management of confirmed COVID-19 (Adapted from the BPAIIG Position Statement: SARS CoV2 Treatment Guidance version 1.2) [37].

Owing to the cytokine storm syndrome in COVID-19, there may potentially be a role of immunomodulators in treating patients with severe infections to ameliorate pulmonary inflammation and hopefully improve mortality. There is an established role of anakinra (IL-1 blockade) in survival benefit of patients with hyperinflammation, without increased adverse events¹⁰

Nursing Management

Proper assessment and monitoring is an important strategy of nursing care while managing children with MIS.

- Monitor Vital signs and look for any variations like elevated temperature, tachycardia, decreased BP
- Blood investigation
- Assess hydration status

- Monitor SPO₂
- Continuous cardiac monitoring is essential so that arrhythmias can be promptly detected and treated.

Children presenting with shock should be resuscitated according to standard protocols.

Empiric antibiotic therapy is appropriate for patients presenting with severe multisystem involvement and particularly those with shock.

The use of antiviral therapies (e.g., remdesivir) is generally limited to children with severe MIS-C manifestations and evidence of active SARS-CoV-2 infection. Treatment should be guided by an infectious disease specialist, preferably in the context of a clinical trial.

Focus on supportive care to maintain hemodynamic stability and ensure adequate systemic perfusion as a Management of myocardial dysfunction.

Children with cardiac dysfunction or CA abnormalities should have a follow-up with cardiology after discharge, with serial echocardiography to assess for CA aneurysms.

Due to community mitigation measures and school closures, transmission of SARS-CoV-2 to and among children may have been reduced in the United States during the pandemic in the spring and early summer of 2020. This may explain the low incidence in children compared with adults. Comparing trends in pediatric infections before and after the return to child care, in-person school, youth sports and other activities may enhance our understanding about infections in children.

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