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A CROSS SECTIONAL STUDY TO ASSESS THE MAGNITUDE OF POST COVID HEALTH ISSUES AMONG ADULTS ATTENDING MEDICAL OPD IN A TERTIARY CARE HOSPITAL IN ERNAKULAM DISTRICT, KERALA

Mrs. Priya Thomas[1], Prof. Sonia Abraham[2], Prof. Dr. Sheela Shenai N A[3]
[1]MSc Nursing Student, Medical Surgical Nursing, M.O.S.C. College of Nursing, Kolenchery.
[2]Professor, Department of Medical Surgical Nursing, M.O.S.C College of Nursing, Kolenchery.
[3]Principal, M.O.S.C. College of Nursing, Kolenchery.

ABSTRACT

The long-term effects of COVID-19 are often referred to interchangeably as long covid and post covid syndrome. ***Objectives:*** *The study was undertaken to assess the magnitude of post covid health issues among adults and to find out the association between magnitude of post covid health issues and selected socio demographic and clinical variables.* ***Methods:*** *A quantitative research approach was adopted. Using convenience sampling, 200 patients attending medical OPD in a tertiary care Hospital in Ernakulam district, Kerala were enrolled in the study. Structured questionnaires were used to obtain data on sociodemographic, clinical variables and magnitude of post covid health issues.* ***Results:*** *The result revealed that 117 (58.5%) of adults reported persistent post covid symptoms, with 109 (54.5%) had mild post covid symptoms and 8 (4.0%) had moderate symptoms. The major co morbidity was hypertension (17.0%). (59.5%) was diagnosed with COVID-19 with in the span of three years. The most common reported post covid symptoms were hair loss 63 (53.85%), frequent headache 35 (29.91%), insomnia 32 (27.35%) chronic fatigue 29 (24.79%), memory deficit and myalgia 23 (19.66%). Least reported symptom was loss of smell 6 (5.13%) and stomach pain 7 (5.98%).* ***Conclusion:*** *The study showed that magnitude of post covid health issues had significant association with gender, BMI, economic status and chronic lung disease ($p<0.05$). The persistence of symptoms in people will definitely pose challenges on our health systems.* ***Key words:*** *Magnitude of post covid health issues, Adults*

INTRODUCTION

COVID-19, according to WHO, is an infectious disease caused by the SARS-CoV-2 virus[1].SARS-CoV-2 infection (COVID-19) was a major pandemic that caused cataclysmic mortality around the world[2]. Post covid Condition, commonly known as long COVID, can affect anyone exposed to SARS-CoV-2, regardless of age or severity of original symptoms. The definition approved by WHO and the National Institute for Health and Care Excellence (NICE) comprise a set of "signs and symptoms that emerge during or after an infection consistent with COVID-19, persisting for more than 12 weeks, and are not explained by an alternative diagnosis"[3].

It is difficult to assess the prevalence of post covid health issues due to the variety of symptoms and the absence of standardized diagnostic criteria. About 10 to 20% of people those infected with SARS-CoV-2 might develop post covid health issues. A recent analysis by the Institute for Health Metrics and Evaluation (IHME), by the end of 2021, 3.92 billion people had acquired SARS-CoV-2, of these, 3.7% (144.7 million) reported post covid health issues as defined by the WHO. Clinical case definition, with 15.1% (22 million) still displaying symptoms 12 months after infection onset. symptoms such as brain fog, fatigue, headaches, dizziness, and breathing difficulties[4].

Majority of COVID-19 survivors are at risk of long-term impairment and disability, mainly critical cases. The management of long covid begins with a thorough evaluation of the patients with persistent symptoms. Direct organ damage, post-ICU syndrome, and metabolic or endocrine disorders should be identified and managed accordingly. Factors leading to persistent symptoms after COVID-19 infection is unknown[5].

Statement of the Problem

A cross sectional study to assess the magnitude of post covid health issues among adults attending medical OPD in a tertiary care hospital in Ernakulam district, Kerala.

Objectives

1. To estimate the magnitude of post covid health issues among adults attending medical OPD.
2. To determine the association between magnitude of post covid health issues among adults and selected socio demographic and clinical variables.

Operational Definitions

Post covid health issues: Post covid health issues refer to long-term symptoms that people experience after recovering from COVID-19 as measured by structured post covid health issue questionnaire.

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Magnitude of post covid health issues: It refers to the prevalence and severity of health problems in the post covid period as measured by structured questionnaire.

Adult: It refers to the individuals who had suffered Covid-19 infections attending the medical OPD in a tertiary care hospital in Ernakulam district, Kerala.

Assumptions

a) Magnitude of post covid health issues may vary based on the clinical variables of adults.

Hypotheses

H_{A1} There is significant association between magnitude of post covid health issues and socio demographic and clinical variables among adults attending medical OPD in a tertiary care hospital in Ernakulam district, Kerala.

H_{A0} There is no significant association between magnitude of post covid health issues and socio demographic and clinical variables among adults attending medical OPD in a tertiary care hospital in Ernakulam district, Kerala.

MATERIALS AND METHODS

Study Design

This cross-sectional study was conducted at medical OPD of MOSC, medical college hospital in Kerala. The study was approved by the institutional ethical committee and written informed consent was obtained from all the participants.

Variables

Outcome variable: Magnitude of post covid health issues among adults.

Sociodemographic variables: Age, gender, BMI, personal habits, religion, education status, occupational status, economic status.

C

linical Variables: Hypertension, diabetes mellites, dyslipidemia, obesity, chronic liver disease, chronic kidney disease, chronic lung disease, heart disease, cerebrovascular disease, immunocompromised conditions: cancer and organ transplant.

Health conditions during COVID-19

Setting of the study

Medical OPD of a tertiary care Hospital, Kolenchery, Ernakulam district.

Population

Target population: Adults of Ernakulam district, who had suffered from COVID-19 infection attending medical OPD.

- Accessible population: Adults, who had suffered from COVID-19 infection attending medical OPD ofa tertiary care Hospital, Kolenchery, Ernakulam district.

Sample, Sample Size and Sampling Technique

Sample: Researcher selected all the adults who had suffered from COVID-19infection attending medical OPD of a tertiary care Hospital, Kolenchery, Ernakulam district.

The sample size: Based on the results of pilot study the sample size was estimated using the formula

Value of the normal deviate at considered level of confidence - Z_ ((1 ∝)/2)(1.96)

Expected Proportion– p

Relative Precision- d (20 unit)

Therefore, sample size is 200 patients who attend the medical OPD of a tertiary care Hospital, Kolenchery, Ernakulam district.

Sampling Technique

The researcher adopted convenience sampling technique to select the study participants.

Sample selection criteria

Inclusion Criteria

- Both male and female patients suffered from COVID-19.
- Aged above 18yrs
- Able to understand English or Malayalam

Exclusion Criteria

- Patient with history of serious health issues or chronic health conditions which could undermine the patient's ability to do self-activities.
- Patients with motor disabilities, cognitive and memory impairment.
- Patients with active psychiatric illness.

Tools and Techniques

Tool 1

Section A- Socio demographic proforma

Socio demographic proforma consists of 8 items include: age, gender, BMI, personal habits, religion, educational status, occupational status, economic status.

Section B: Clinical Variables

Clinical variables consist of 10 items including: hypertension, diabetes mellitus, dyslipidemia, obesity, chronic liver disease, chronic kidney disease, chronic lung disease, heart disease, stroke, immunocompromised conditions: -cancer, organ donation

Section C: Health Conditions During COVID-19

Health conditions during COVID-19 consist of 9 items including: Time since the diagnosis of COVID-19? Have you been admitted to hospital with a diagnosis of COVID -19?

Have you got admitted to intensive care unit during COVID-19 infection? Mechanically ventilated during COVID-19infection? Have you been discharged on

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long-term oxygen therapy? Have you received the corona vaccine?

Section D: Structured Post Covid Health Issues Questionnaire

Structured post covid health issues questionnaire consist of 16 items (yes or no questions).

Tool 2: Structured questionnaire to assess the magnitude of post covid health issues.

Structured questionnaire was developed by the investigator to assess the magnitude of post covid health issues. The questionnaire is a five-point Likert scale with 19 items, scoring from 0 –76, where 0-none,1-mild,2-moderate,3-severe,4-very severe. The total score was arbitrarily categorized in to:

Scoring	Remarks
0 -19	Mild
20 -36	Moderate
37 - 58	Severe
>59	Very severe

Whether you were put on oxygen therapy during COVID-19 infection?

Ethical Considerations

The investigator has considered the following ethical principles while proceeding with the project. This study protocol was approved by the Institutional Ethics Committee of MOSC Medical Mission Hospital, Kolenchery. Formal permission was obtained from concerned hospital authorities. Informed consent was obtained from the study participants. Confidentiality and anonymity of the data were ensured using subject coding system.

Pilot Study

After obtaining ethical clearance from IEC and permission from authorities, pilot study was conducted among 30 patients attending medical OPD. The study participants were identified based on inclusion criteria and selected using convenience sampling technique. Informed consent obtained from the participants. Participants were assured about the anonymity and confidentiality of the information provided by them. Data were collected using socio demographic proforma and structured questionnaire to assess the magnitude of post covid health issues. After pilot study, it was found that the study was feasible and practicable, the time and cost of the study was within the limits.

Data Collection Process

After obtaining ethical clearance from IEC, MOSC Medical College Hospital Kolenchery, Ernakulam, formal permission was obtained from the principal, college of nursing and medical superintendent. Patient who was attending medical OPD were approached individually and those who met the inclusion criteria were enrolled in the study using convenience sampling technique. The participants were allowed to read the participants information sheet and provision to clarify the doubts. Following this, informed consent was obtained from the participants, data were collected using the predetermined tools in a single appointment. Approximate time taken for data collection from each participant is 15 to 20 minutes. The investigator thanked each participant for their cooperation for the study.

Plan for Data Analysis

Descriptive and inferential statistics were employed in the analysis of the data in accordance with the specified objectives.

- The data collected was coded in Microsoft excel.
- EZR software was used to analyze the data.
  Socio demographic variables, clinical variables, health conditions during COVID-19 and structured post covid health issues questionnaire was summarized by using frequency and percentage distribution
- Chi square or Fisher exact test were performed to determine the association of
- magnitude of post covid health issues with socio demographic and clinical variables.
- Level of significance was considered as $P < 0.05$.
- Data were presented using tables and figures.

Description of Socio Demographic Variables

Majority 47.5% of the study participants belongs to the age group of18-35. Most of them were females 59%. Most of the study participants 70% had no personal habits like smoking, alcoholism etc. More than half of the participants 57.5% were Christians. A greater number 66% had degree and above education. About 69.5% of participants were employed and 81% belongs to APL category.

Table :1Frequency and percentage distribution of participants based on sociodemographic variables.

Socio Demographic Variables		Frequency (f)	Percentage (%)
1. Age			
	a) 18-35	**95**	**47.5**
	b) 36-55	87	43.5
	c) 56-70	16	8.0
	d) 71 and above	2	1.0
2.Gender	a) Female	**118**	**59**
	b) Male	82	41
3.Personal habits	a) Smoking	30	15
	b) Alcoholism	28	14
	c) Other	2	1
	d) No habits	**140**	**70**

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4.BMI	a) Healthy b) Underweight c) Overweight d) Obesity	127 25 45 3	63 13 22 2
5.Religion	a) Christian b) Hindu c) Muslim d) Others	**115** 65 14 6	**57.5** 32.5 7.0 3.0
6. Educational Qualification	a) Primary school b) Higher secondary school c) Degree and above	19 49 **132**	9.5 24.5 **66.0**
7.Employed	a) Yes b) No	**139** 61	**69.5** 30.5
8.Ecnomic status	a) APL b) BPL	**162** 38	**81** 19

Table 2: Frequency and percentage distribution of participants based on clinical variables.

17% of study participants were suffering from hypertension.15.5 % were suffering diabetes mellitus, cholesterol, obesity respectively. Participants who had chronic lung disease was only 2%.

None of the participants were suffering from chronic liver disease, chronic kidney disease, stroke and immunocompromised conditions.

	Clinical Variables	Frequency (f)	Percentage (%)
1	**Diabetes mellitus** Yes No After covid 19 infection	 **31** 168 1	**15.5** 84.0 0.5
2	**Cholesterol** Yes No After covid 19 infection	 **31** 167 2	 **15.5** 83.5 1.0
3	**Obesity** Yes No	 **31** 169	 **15.5** 84.5
4	**Chronic lung disease** Yes No After COVID-19 infection	 4 195 1	 2.0 97.5 0.5
5	**Heart diseases** Yes No	 **1** 199	**0.5** 99.5

Table :3 Frequency and percentage distribution of participants based on health condition during COVID-19

Most of the study participants (59.5%) was diagnosed with COVID- 19 with in the span of three years and 1.5% of the study participants were admitted to the hospital with COVID-19. Only 0.5 % received oxygen therapy during COVID-19 infection. No participants (100%) were admitted to the intensive care unit, mechanically ventilated during COVID-19 infection nor discharged on long term oxygen therapy. Majority 97.5% received corona vaccine.

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	Health Condition During COVID -19	Frequency(f)	Percentage (%)
1	**Time since the diagnosis of COVID-19?**		
	a) Three years	**119**	**59.5**
	b) Four years	74	37.0
	c) Above four years	7	3.5
2	**Have you been admitted to the hospital with a diagnosis of COVID- 19?**		
	Yes	**3**	**1.5**
	No	197	98.5
3	**Whether you were put on oxygen therapy during COVID-19 infection?**		
	Yes	**1**	**0.5**
	No	199	99.5
4	**Have you received the corona vaccine?**		
	Yes	195	97.5
	No	5	2.5

Table 4: Frequency and percentage distribution of participants based on post covid health issues
117 (58.5%) reported persistent post covid health issues and 83 (41.5%) had no symptoms.

Post covid health issues	Frequency (f)	Percentage (%)
Yes	**117**	**58.5%**
No	**83**	**41.5%**

Table 5: Frequency and percentage distribution of post covid health issues among symptomatic patients.

	Post covid health issues	Frequency (f)		Percentage (%)	
		Yes	No	Yes	No
1	Frequent headache	**35**	**82**	**17.5**	**41.0**
2	Memory deficit	**23**	**94**	**11.5**	**47.0**
3	Lack of concentration	19	98	9.5	49.0
4	Insomnia	**32**	**85**	**16.0**	**43.5**
5	Cough	19	98	9.5	49.0
6	Dyspnea	15	102	7.5	51.0
7	Chest pain	8	109	4.0	54.0
8	Palpitation	9	108	4.5	95.5
9	Dizziness	12	105	6.0	52.5
10	Chronic fatigue	**29**	**88**	**14.5**	**44.4**
11	Loss of weight	19	98	9.5	49.0
12	Myalgia	**23**	**94**	**11.5**	**47.0**
13	Stomach pain	7	110	3.5	55.5
14	Loss of appetite	8	109	4.0	54.5
15	Loss of smell	6	111	3.0	55.5
16	Hair loss	**63**	**54**	**31.5**	**27.0**

Table: 5 interprets that most common persistent symptom was hair loss 63 (53.85%), followed by frequent head ache 35 (29.91%), insomnia 32 (27.35%), chronic fatigue 29 (24.79%), memory deficit and myalgia 23 (19.66%). Least reported symptom was loss of smell 6 (5.13%) and stomach pain 7 (5.98%).

Other symptoms include lack of concentration, cough, loss of weight is 19 (16.24%). Dyspnea was 15 (12.82%) , 12 (10.26%) had dizziness. Chest pain and palpitation were 8(6.84%), 9 (7.69%) respectively.

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Table:6 Frequency and percentage distribution of participants based on magnitude of post covid health issues

Magnitude of post covid health issues	Catageory	Frequency (f)	Percentage(%)
Mild	0-19	109	54.5
Moderate	20-36	8	4.0

109 (54.5%) patients had mild post covid symptoms and 8 (4.0%) had moderate post covid health issues. None of them had severe and very severe symptoms.

Association between magnitude of post covid health issues among study participants and Sociodemographic variables, clinical variables and health condition during COVID- 19.

Chi-square and fisher's exact tests were performed to determine the association between magnitude of post covid health issues and socio demographic variables among patients attending medical OPD in a tertiary care hospital.

Magnitude of post covid health issues categorized as mild (0-19), moderate (20-36), severe (37-58), and very severe (59-76).

Table 7: Association of magnitude of post covid health issues and socio demographic variables

Table:7 shows that there is significant association between magnitude of post covid health issues and selected socio demographic variables such as gender($p<0.05$), BMI ($p< 0.004$), and economic status ($p<0.008$). Table :8 shows that there is significant association between magnitude of post covid health issues and chronic lung disease ($p= <0.01$)

Table:9 shows that there was no significant association between magnitude of post covid health issues and health condition during COVID- 19.

Socio Demographic Variables	Frequency (F)		Chi-Square/Fishers Exact Test	P Value
	Mild	Moderate		
1.Age				
a.18-35 years	54	4		
b. 36-55 years	40	0	(1.45)	0.62
c. 56-70 years	14	0	Fishers exact	
d. 71 and above	1	0		
2.Gender				
a. Female	72	8	**(2.55)**	**0.05***
b. Male	37	0	**Fishers exact**	
3.BMI				
a. Under weight	15	2		
b. Healthy	63	0	**(19.78)**	**0.004***
c. Over weight	30	2	**Fishers exact**	
d. Obesity	1	2		
4.Personal Habits				
a. Smoking	21	0		
b. Alcoholism	6	0	(2.82)	0.53
c. Others	2	0	Fishers exact	
d. None	80	8		
5. Religion				
a.Christian	65	3		
b. Hindu	34	5	(3.55)	0.36
c. Muslim	5	0	Fishers exact	
d. Others	5	0		
6. Educational status				
a. Primary school	11	1	(0.05)	
b. Highersecondary school	29	2	Fishers exact	1.00
3. Degree and above	69	5		
7. Occupational status				
a. Employed	79	7	(0.26)	0.67
b. Un employed	30	1	Fishers exact	
8.Economic status				
a. APL	90	3	**(6.72)**	**0.008***
b. BPL	19	5	**Fisher exact**	

*** Significance at p<0.05**

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Table 8: Association of magnitude of post covid health issues and clinical variables

Clinical Variables	Frequency (F)		Chi Square /Fishers Exact Test	P Value
	Mild	Moderate		
1.Hypertension				
Yes	11	1	(0.11)	0.62
No	97	7	Fishers exact	
After COVID -19	1	0		
2. Diabetes mellites				
Yes	12	1	(0.08)	1.00
No	96	7	Fishers exact	
After COVID -19	1	0		
3.Cholesterol				
Yes	15	0	(1.45)	0.64
No	92	8	Fishers exact	
After COVID -19	2	0		
4.Obesity				
Yes	17	1	(1.96)	1.00
No	92	7	Fishers exact	
5.Chronic lung disease				
Yes	3	1	(16.08)	**0.01***
No	106	6	Fishers exact	
After COVOD -19	6	1		
6.Heartdiseases				
Yes	1	0	(9.65)	1.0
No	108	8	Fishers exact	

*** Significance at p<0.05**

Table 9: Association of magnitude of post covid health issues and Health condition during COVID -19

Health Condition During COVID-19	Frequency (f)		Chi square /fishers exact test	p value
	Mild	Moderate		
1.Time since the diagnosis of COVID 19?				
One year	64	4	(5.96)	
Two years	44	3	Fishers exact	0.18
Three years	1	1		
2.Have you been admitted to hospital with a diagnosis of COVID - 19?				
Yes	3	0	(2.92)	1.0
No	106	8	Fishers exact	
3.Whether you were put on oxygen therapy?				
Yes	1	0	(9.65)	
No	108	8	Fishers exact	1.0
4.Have you received the corona vaccine?				
Yes	106	8	(2.92)	1.0
No	3	0	Fishers exact	

*** Significance at p<0.05**

DISCUSSION

The present study was intended to assess the magnitude of post covid health issues among adults attending medical OPD. The findings of the present study have been discussed about to the observation made by other studies which investigator had reviewed.

The present study findings 59% females and 41% males align with, a cross sectional study conducted among 500 covid 19 affected individuals demonstrated that 57.43% females and 42.57% males reported to have post covid syndrome it is found that female sex can also be a risk factor of post COVID-19[6].

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The present study found that 17% of study participants were suffering from hypertension The study finding was supported by a community-based prospective cohort study comprising 250 patients shows the most common comorbidity among patients was hypertension 60 (24%)7.

The present study found that 117 (58.5%) reported persistent post covid health issues.
The most common persistent symptom was hair loss 63 (53.85%) The findings of the present study consistent with a prospective study conducted among 413 participants, majority of the participants (79.7%) experiencing post covid symptoms8. The findings of the present study supported by an electronic survey was conducted in Brazil highlights that hair loss was observed in more than one third of the individuals9.

The present study revealed that ,109 (54.5%) patients had mild post covid symptoms and 8 (4.0%) had moderate post covid health issues and there is significant association between magnitude of post covid health issues and selected socio demographic, clinical variables such as gender ($p<0.05$), BMI ($p< 0.004$), economic status ($p<0.008$) and chronic lung disease ($p= <0.01$). The present findings were supported by the findings of a systematic review and meta-analysis shows that BMI has significant association with post covid health issues10. The result was contradicted by a cross-sectional study conducted in the Kingdom of Bahrain on COVID-19 infected patients conclude that BMI does not impact post-COVID-19 symptoms and does not determine its severity11.

Nursing Implications
The present study had significant implications in the field of nursing administration, nursing education, nursing practice, and nursing research.

Nursing Administration
- Nurse administrators can arrange provision of specialized training for nurses managing those patients.
- Develop and enforce standardized protocols and guidance based on research findings to ensure high quality care for all post covid patients.

Nursing Education
- Integrate comprehensive modules on post covid health issues to nursing curricula.
- Provide opportunities for nursing students to gain hands on experience in assessing and managing post covid patients.

Nursing Practice
- Nurse should conduct detailed assessments to identify common post covid symptoms in clinical practice.
- Educate patients on managing persistent symptoms through lifestyle modification, breathing exercises, and medication adherence.

Encourage participation in rehabilitation programs to improve physical function and over all wellbeing.

Nursing Research
Prioritize research on the most prevalent post covid health issues.
- Focus on studying the specific impact on vulnerable populations. (older adults, patients with preexisting conditions, patients who were mechanically ventilated during covid infections).
- Present study adds to the body of knowledge.

LIMITATION
Self-report bias could not be eliminated completely

RECOMMENDATIONS
- A mixed method approach can be used to capture both prevalence and experiences of post covid health issues.
- A longitudinal study to track the progression of post covid symptoms and long-term health outcomes.

CONCLUSION
Long COVID is a multisystemic illness with persistent symptoms from all organ systems affecting the quality of life of millions of individuals worldwide. More than 50% of COVID-19 survivors experience at least one symptom 2 years after acute illness. Incidence of post covid was 54.5% in our study. Most common manifestation of post covid syndrome is hair loss. Therefore, follow-up and rehabilitation care for COVID-19 patients must be focused on addressing the needs of these people for the longer term.

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