Long Term Impact Of Covid-19 On Functional Capacity and QOL Among Nurses

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ABSTRACT

The Coronavirus disease (COVID-19) pandemic is one of the major health crisis worldwide. Mental health of medical and nursing staff met greatly challenged during the immediate wake of the viral epidemic and most of the studies focused on short term impact of pandemic. This study tried to explore the long term impact of Covid-19 on functional health status and QOL among nurses. The aim of this study is to examine the impact of Covid-19 on functional capacity and Quality of Life (QOL) among female nurses. 50 Nurses working in COVID-19 pandemic were included. Their functional status was assessed using 6minute walk test (6MWT) and SF- 36 questionnaire was used to evaluate the Quality of Life. The data was collected and analyzed with appropriate statistical tools. The study results showed that the mean value of 6MWT observed in nurses was 298±117meters and average Gait speed was 0.85±0.28 meters per second. SF-36 scores which is related to the QOL shows that, the least scored components of quality of life was role limitation to physical health (Mean/SD =12.50±29.12) followed by role limitation due to emotional problem (Mean/SD=37.30±18.62) and role limitation due to energy/fatigue (Mean/SD=37.80±18.16). The highest score was obtained for the component social functioning (Mean/SD=53.50±14.95). This study concluded that functional ability of nurses worked in Covid pandemic is reduced and health related quality of life observed low in the component of role limitation due to physical health.

Keywords: COVID-19 Pandemic, Nurses, Functional Capacity, 6 Minute Walk Test.

INTRODUCTION

The Coronavirus disease (COVID-19) pandemic is one of the major health crisis challenged the lives of millions globally.[1] Population based studies reported that this pandemic has spread to 198 countries, with approximately 2.4 million confirmed cases and 150,000 deaths globally.[2-4] Frontline healthcare workers (HCWs) exposed to high risk of infection and death due to increased COVID-19 exposure.[5] The frontline healthcare workers are at risk of physical and mental health illness as a result of provision of continuous care to patients with COVID-19. Nurses are one among them making close contact with the patients. Joodaki Z (2019) et al stated that occupation of nursing considered as one of the first four stressful professions all around the world, which expose them to various physical, psychological, and social stress leads to physical and mental illness.[6] Hyperactive host immune response leads to inflammation of the respiratory system and affects the lung function in coronavirus disease 2019 (COVID-19). [7] Functional capacity can be defined as a capability of performing tasks and activities which is necessary or desirable in individual lives. The assessment of functional capacity reflects the individual ability to perform activities of daily living which requires sustained aerobic metabolism.[8] 6-minute walk test (6MWT) provides a standardized, objective, integrated assessment of cardio pulmonary and musculoskeletal function, relevant to the daily activities. [9.10] The self-paced 6MWT helps to assess the sub-maximal level of functional capacity and can be applied in a long-term follow-up study of survivors of ARDS.[11] In this study 6MWT was used to evaluate the functional capacity among nurses to find out the impact of COVID-19. The Nurses worked during COVID-19 pandemic plays a very important role in patient care and exposed to many stresses that may affect their quality of life1.[12] Occupational conditions and stress have serious impacts on nurses health and quality of life.[6,13] Evidence based reports shown that nurses have higher occupational stresses than other health workers, including physicians.[14,15] Short-Form Health Survey (SF-36) questionnaire is one of the psychosocial outcomes used in this study to evaluate the quality of life among nurses. Montazeri et al. 3 confirmed the validity and reliability of the SF-36 questionnaire in a healthy population.[16] The previous studies showed that the mental health of medical and nursing staff met greatly challenged during the immediate wake of the viral epidemic and most of the studies focused on the short-term impact of the pandemic. However, no qualitative data related to the long-term impact of COVID-19 on the physical and mental health of medical personnel. Hence this study tried to explore the impact on functional health status and QOL among nurses. This study helps to identify the risk factors and factors to be considered among nurses to improve their physical and mental health. Effective responses and interventions could relieve a series of new-onset physical and mental

health problems. This study aimed to determine the impact of COVID-19 on functional capacity and QOL among female nurses in RMMCH.

MATERIALS AND METHOD

A cross-sectional study (descriptive type) was conducted between the periods from April 2022 to September 2022. The study was carried out among nurses in RMMCH, Chidambaram. The purpose of the study was clearly explained, and informed consent was obtained before the study. 50 nurses working in the COVID pandemic period 2020-2022 were included from RMMCH based on the inclusion criteria using a convenient sampling method. History of COVID infection at least once, age between 25 - 50 years, female nurses, willing to participate in the study and the exclusion criteria were physically challenged people, history of cardiovascular and respiratory problems, history of recent fractures, muscle strain, and sprain, history of recent neurological and orthopaedic surgeries, acute illness, not willing to participate. Baseline characteristics were recorded by structured proforma for the following parameters: age, education level, employment status, marital status, working period in the COVID ward, history of COVID infection, and vaccination status. Their functional status was assessed using a 6-minute walk test (6MWT). All subjects performed 6MWTs according to a standard protocol. All subjects received the same instructions before the walk and were encouraged by the investigator. Each subject underwent the 6MWT in an undisturbed 30-m indoor, level, hospital corridor. The 6MWD covered during the test was recorded in meters. SF- 36 questionnaire was used to evaluate the Quality of Life. The data were collected and analyzed using descriptive statistics.

RESULTS AND DISCUSSION

In this study statistical software SPSS version 22 has been used for the analysis. Six-minute walk test (6MWT) was used to assess the functional capacity of nurses and the SF- 36 questionnaire was used to evaluate the Quality of Life. Descriptive statistics were done and the Chi-square test was used to find out the association between the number of COVID attacks and functional capacity. Table -1 displayed the mean age and mean values of 6 MWD and gait speed. It is inferred from table 1 that the mean age of the nurses was 39.34±8.83 years. The mean 6 - MWT distance was 298.36±117.09 meters. The average Gait speed of the study subject was 0.85±0.28 meters per second. Table 2 displayed the number of episodes of COVID attacks among the study population. It is inferred from table 3 that most of the nurses were affected by COVID once (88%). It is noted that 10% of the nurses were affected by COVID twice and only 2% had been infected with COVID thrice. Table -3 displayed mean and standard deviation of SF-36 scores which is related to the QOL among the study population. It is inferred from table 3 that, the least affected components of quality of life in

SF-36 score were X2, M=12.50±29.12 (role limitation to physical health) followed by X3, M=37.30±18.62 (role limitation due to emotional problem and X4, M=37.80±18.16 (role limitation due to energy/fatigue). The highest score was obtained for the component X6, M=53.50±14.95 (social functioning). It is further noted that most of the component's score was less than 50% displayed in fig-1. It is inferred from the table 4 that, the mean distance covered by the patients affected with COVID once was 327.25±98.27 meters whereas it was 173.00±19.59 for twice COVID affected and 161m for COVID affected thrice. The difference was statistically significant, with the p-value (<0.05).

Table 1: Age and Physical performance of the nurses

	Mean	S.D
Age (years)	39.34	8.83
6 MWT Distance (meters)	298.36	117.09
Gait speed (m/sec)	0.85	0.28

Table 2: Frequency of Covid exposure

COVID (Frequency)	N	%
1	44	88
2	5	10
3	1	2

Table 3: Quality of life score – Descriptive analysis of different components of the score

Component	Mean	S.D
Physical Functioning (X1)	44.20	22.91
Social Functioning(X2)	53.50	14.95
Role limitation due to Physical Health (X3)	12.50	29.12
Role limitation due to Emotional Problem(X4)	37.30	18.62
Emotional well-being (X5)	42.00	14.42
Energy / Fatigue (X6)	37.80	18.16
Pain (X7)	47.19	17.48
General Health (X8)	42.00	7.69

Table 4: Comparison of 6 min walking distance with frequency of Covid exposure

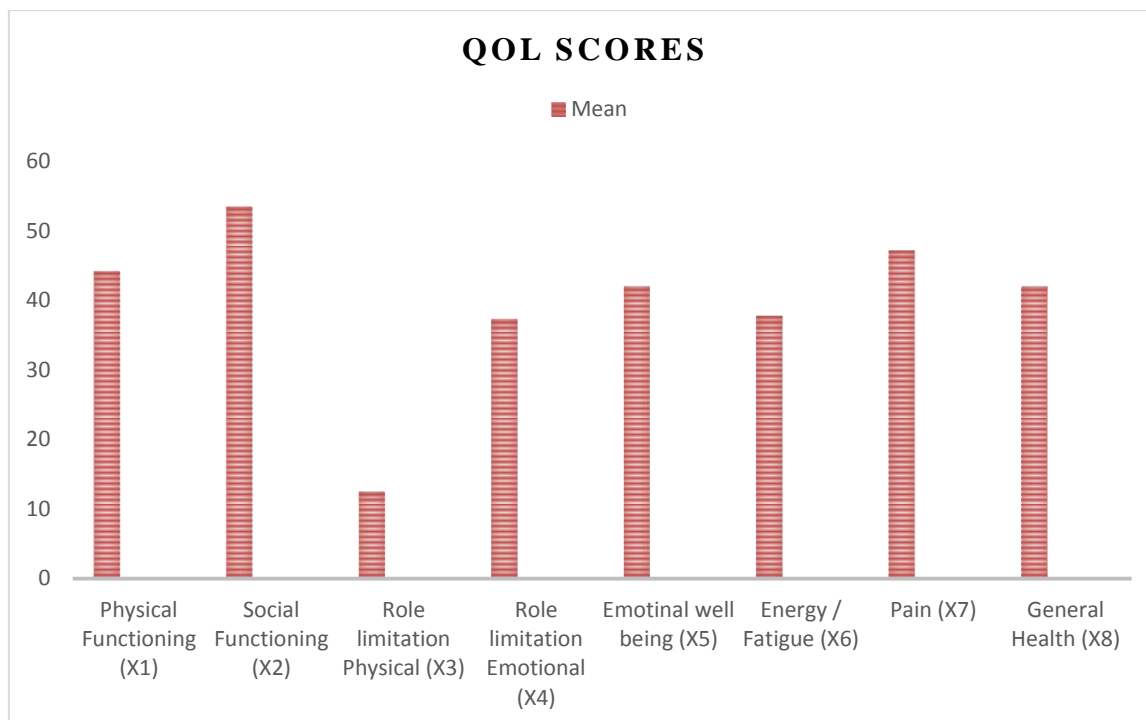| Covid Frequency	N	Mean	S.D	ANOVA F	P
Once	44	327.25	98.27	7.27	0.002
Twice	5	173.00	19.59		
Thrice	1	161.00	-		

Figure 1: QOL Scores

DISCUSSION

This study aimed to determine the impact of COVID-19 on functional capacity and QOL among female nurses. A cross-sectional study included 50 nurses working during COVID -19 pandemic. Their functional status and QOL were assessed using 6MWT and SF-36. Semi-structured proforma was used to collect the data: age, education level, employment status, marital status, and working period in the COVID ward, and vaccination status. From the results, it was observed that the mean age of the study population was 39 years and most of the people observed were in the age group of 39-40 years. Results related to the educational levels revealed that most of the nurses completed diploma and degree in nursing. 86 % of the nurses were married and 14 % of the nurses were unmarried. All the nurses had experience in working in COVID wards last two years in different periods. It was also observed that all the nurses were vaccinated with two doses of COVID vaccine. In this study, it was observed that 88% of the nurses exposed to COVID attack at least once, 10% twice, and 2% of nurses affected thrice.

The present study showed that the mean values of 6MWT observed in nurses were 298±117m and range 501-150m while the other study showed considerable variability in the 6MWT of healthy subjects aged 25-80yrs was 495 09±83.85m with the range 294-691m. The observed mean value of 6MWT is low compared to normal healthy adults[17]. Ramanathan Palaniappan et al declared the reference value of 6MWT in the Indian population in females observed as 470±71.433-34. In this study the observed mean values of 6MWT among nurses were low compared to the reference value in the other studies. This difference may be due to the

individual differences in physical activity, musculoskeletal growth, and psychological status between normal healthy adults and nurses[18,19]. Apart from this, exposure to the COVID infection leads to reduced pulmonary function which alters the functional capacity of the nurses. Similar results found in the study done by Yiying Huang et al declared that the 6MWD of COVID patients was significantly shorter[20]. The reduced 6 MWT may be due to long-term exposure to the COVID duty might influence the functional capacity and psychological status. Iwama AM et al stated that psychological status related exercise capacity is the important source causing the potential difference in 6MWD[21]. In this study, the association between the number of COVID attacks and functional capacity was evaluated. The observed results showed that there is a significant correlation between the number of attacks of COVID and 6MWD. The person affected by COVID twice covers a shorter distance than the person affected by COVID once which is statistically significant. In this study, SF- 36 was used to evaluate health-related quality of life which has 36 items in eight subscales categorized into two generic components: Physical component summary (PCS) and mental component summary (MCS). Scores are coded, summed, and converted to a scale of 0 to 100, with 0 reporting the worst and 100 reporting the best condition. The SF-36 scores (QOL) showed that there is 44% for physical functioning, 12.5 % for role limitation to physical health, 37.30% for role limitation due to emotional problems, 37.80% for energy/fatigue, 42% for emotional well-being, 53.50% of social functioning, 47.19% of pain, 42% of general health. The observed results related to QOL showed that the social functional component scored highest, followed by limitation to physical health, followed by limitation due to emotional problems, and limitation due to energy and fatigue. These results co-relates well with the study done by S. van der Sar - van der Bruggeet al found a low score on the SF-36 domain score for physical role limitation[22]. The study results revealed that the physical health component is much reduced among the nurses. The social and functioning component is average and the mental component is moderate. Similar results found in the study done by Luciano Gattinoni et al. (2020) observed that COVID survivors have experienced severe limitations in their functionality and poor quality of life after active infection[19]. The study results concluded that the functional status of nurses worked in the COVID pandemic is reduced compared with the reference values observed in the normal population. This study focussed on the long-term impact of the COVID pandemic on functional ability and QOL while most of the studies were carried out in acute and mid-term. Simple and standardized outcome measures were used in this study are the strength of this study. This study has few limitations; The sample size was small, and this study included nurses from a single hospital, The occupational and environmental factors were not considered in this study, Further studies are needed with the larger population including occupational and ergonomic factors.

CONCLUSION

This study concluded that the functional ability of nurses worked in COVID pandemic is reduced and health-related quality of life was observed low in the component of role limitation due to physical health. This study recommends implementing effective measures to improve functional capacity and health-related QOL among nurses.

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