Effectiveness of Rehabilitative Nursing Intervention on Pain, Anxiety, Stress and Quality of life among Post COVID-19 Elderly Patients

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Abstract

Background: COVID-19 is a highly contagious respiratory illness that poses a significant public health emergency, leading to varying levels of respiratory, physical, and psychological challenges. **Aim:** the aim of this study to evaluate the effectiveness of rehabilitative nursing intervention on pain, anxiety, stress and quality of life among elderly patients post COVID-19. **Methods:** A quasi-experimental design research design (one group pre & posttest). Fifty elderly patients of both genders were selected from those who had attended the Post COVID-19 outpatient clinic. **Tools:** A structured interview questionnaire was created, encompassing personal attributes and medical background, the numeric pain rating scale, post-COVID conditions assessment, coronavirus anxiety scale, the 36-item COVID stress scales, and post-COVID-19 pandemic quality of life evaluation. This questionnaire was administered both before and after the intervention. **Results:** There was a significant improvement in pain, anxiety stress and quality of life among elderly patients post COVID-19 in the post-test compared to the pre-test (p value= 0.001). Also, there were significant positive correlations among pain with stress, and anxiety levels in post-tests (r values 0.479, 0.463), respectively and there were significant negative correlations among quality of life with pain, anxiety and stress levels in post-tests (r values -.455, -.727, -.708), respectively. **Conclusion:** The study revealed significant improvement of pain, stress, anxiety levels, and quality of life among the elderly patients after implementation the rehabilitative nursing intervention. **Recommendation:** Further research is needed to explore challenges associated with post-COVID complications and the enhancement of resilience among older adults in coping with the stresses brought by the post-COVID complications.

Key words: Nursing rehabilitation intervention, Pain, Anxiety, COVID Stress, Quality of Life, Elderly, Post COVID-19.

Introduction

COVID-19 has become a significant medical and nursing challenge in recent times. Since the beginning of the pandemic, the World Health Organization (WHO) has documented more than 636 million cases and 6.6 million deaths **(Ostrowska et al., 2023).** This highly contagious respiratory illness results in respiratory, physical, and psychological impairments in affected individuals. Due to its infectious nature, individuals with COVID-19 are isolated to prevent the spread of SARS-CoV-2. As a result, there is a considerable decrease in social interactions, leading to sensations of loneliness and isolation among patients **(Demeco et al., 2020).**

The elderly population is encountering substantial challenges and threats during this period in numerous countries. Although all age groups are susceptible to COVID-19, older individuals face a heightened risk of severe illness, particularly when pre-existing health conditions are present due to physiological changes associated with aging. The COVID-19

pandemic has brought attention to the detrimental impact on the elderly, who are more prone to illness and at an increased risk of complications leading to death **(Elemam et al., 2021).**

According to the World Health Organization (WHO), post-COVID-19 syndrome, also known as long COVID-19, is defined by an array of persistent symptoms lasting a minimum of 2 months, appearing within 3 months after the start of COVID-19. Common symptoms linked to post-COVID-19 syndrome are chest pain, tiredness, shortness of breath, cough, and producing sputum **(Cabrera et al., 2021).**

Certainly, COVID-19 goes beyond respiratory symptoms, impacting various organs and systems. Additional manifestations include joint pain, muscle pain, headaches, palpitations, loss of smell, altered taste, hair loss, and cognitive issues such as memory or concentration problems **(Ceban et al., 2022; Crook et al., 2021; Yong, 2021).** Moreover, individuals recovering from COVID-19 commonly face psychological challenges, including anxiety, stress, depression, and a decline in their quality of life. Factors linked to the development of post-COVID-19 conditions include advanced age, female gender, severe clinical status, multiple comorbidities, hospitalization, and the need for oxygen supplementation **(Cabrera et al., 2021; Kubica et al., 2021; Renaud-Charest et al., 2021).**

As per the World Health Organization (WHO), post-COVID-19 syndrome, also known as long COVID-19, is described as a cluster of prolonged symptoms lasting at least 2 months, emerging within 3 months from the onset of COVID-19 **(Sykes et al., 2021; Mandal et al., 2021).** Many individuals recovering from COVID-19 require an extended period to resume their previous lifestyle, often with intricate rehabilitation needs. Consequently, comprehensive rehabilitation involving multiple disciplines becomes an essential component of the COVID-19 recovery process **(Jolanda et al., 2022).**

Rehabilitation nurses play a vital role in the care of elderly COVID-19 patients, actively engaging in rehabilitation interventions throughout various phases of the disease, both during and after its course. Prior to rehabilitation, each patient must undergo a thorough assessment to establish an individualized and appropriate discharge rehabilitation plan. This plan is based on factors such as the patient's needs, physical and emotional functional abilities, and the support available from their family **(Mohamed al., 2021)**

Significance of the study:

Surviving COVID-19 represents just the tip of the iceberg. In a significant portion of individuals who have recovered from COVID-19, symptoms persist for months, or new symptoms emerge after the acute phase of the disease **(Sykes et al., 2021; Mandal et al., 2021)**. The demand for adequate and specialized geriatric rehabilitation services has risen during the COVID-19 pandemic. Managing older post-acute COVID-19 patients poses considerable challenges due to the diverse presentation of COVID-19, coupled with age-related issues such as frailty, cognitive impairments, and multiple health conditions **(Jolanda et al., 2022).** Therefore, the current study focuses on evaluating the effectiveness of rehabilitative nursing intervention on pain, anxiety, stress, and quality of life among elderly patients post-COVID-19.

Aim of the study

The objective of this study was to evaluate the effectiveness of rehabilitative nursing intervention on pain, anxiety, stress and quality of life among elderly patients post COVID-19.

Research hypothesis:

Null Hypothesis:

H0: The nursing rehabilitative intervention will exhibit no improved in pain, anxiety, stress and quality of life among elderly post COVID-19 in posttest than pretest.

Alternative Hypothesis:

H1: Pain, anxiety, stress and quality of life will be improved after application the rehabilitative nursing intervention among

elderly post COVID-19 in posttest than pretest.

H2: Positive correlation between pain, anxiety, stress and quality of life after application the rehabilitative nursing intervention among elderly post COVID-19 in posttest than pretest.

Subjects and Method

Research Design:

The study was conducted as a quasi-experimental design research design (one group pre & posttest).

Setting:

The research was conducted at the Post COVID-19 Outpatient Clinic, situated within the Main Assuit University Hospital. This clinic occupies a tranquil space on the second floor of the clinics building, specifically within the fever clinic area. It is situated next to a 10-meter corridor. The clinic is furnished with necessary amenities, including an abdominal X-ray machine, blood pressure apparatus, a weighing scale, and a pulse oximeter.

Sample:

A total of fifty adult patients, encompassing both genders, were chosen from individuals who had attended the post-COVID-19 outpatient clinic. The selection process employed the purposeful sampling method, and the sample size was determined utilizing the specified equation according to **Steven & Thompson (2012).**

$$n = \frac{N \times P(1-P)}{[N-1 \times (d^2 \div Z^2)] + P(1-p)]}$$

N= total patient population size, Z= confidence level is 0.95 and is equal to 1.96, D= the error ratio is = 0.05, P= the property availability ratio and neutral = 0.50

Inclusion criteria

(1) Individuals aged 60 years and older, of both genders, who were diagnosed with COVID-19 confirmed through PCR and/or HRCT chest scans and laboratory tests.
(2) Capable of verbal communication.

(3) Have not undergone prior rehabilitative interventions for COVID

Exclusion criteria: The presence of COPD or any other chronic respiratory disease, moderate severe heart disease, stroke or neurodegenerative diseases.

Tools of the study:

To gather the required data for the research, six tools were employed:

Tool I: A structured interview questionnaire was developed by the investigator to collect the necessary data. It comprised two parts:

• **Part (I):** Focused on the personal characteristics of the patients, such as age, gender, residence, level of education, and marital status.

• **Part (II):** Included the collection of medical history; a comprehensive history was taken from elderly patients, encompassing past medical history and clinical evaluation, which involved assessing vital signs and oxygen saturation.

Tool II: The Numeric Pain Rating Scale (McCaffery, 1989) The Numeric Pain Rating Scale, a widely used tool for assessing pain intensity, was employed in this study. Elderly participants were asked to provide three pain ratings, reflecting their current, best, and worst pain experiences within the past 24 hours. The average of these three ratings was then calculated to indicate the level of pain experienced by the elderly individual over the preceding 24-hour period.

On the Numeric Pain Rating Scale, a score of (0) indicates the absence of pain, while (10) signifies the most intense pain possible. The scale categorizes pain levels as follows: 0 (no pain), 1-3 (mild pain), 4-6 (moderate to severe pain), and 7-10 (severe pain) **(McCaffery, 1989).**
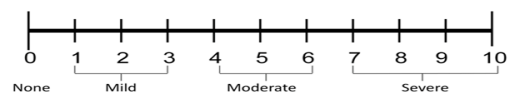

Figure (1): The Numeric Pain Rating Scale **(McCaffery, 1989).**

Validity and reliability:

High test–retest reliability has been observed in both literate and illiterate patients (r = 0.96 and 0.95, respectively) before and after intervention.

Tool III: Post-COVID Conditions (CDC, 2022).

The CDC previously utilized the term "post-COVID conditions" (PCC) to encompass a wide range of health consequences that may appear four or more weeks after being infected with SARS-CoV-2, the virus responsible for COVID-19. Post-COVID conditions were associated with various physical, social, and psychological implications, as well as functional limitations, presenting considerable challenges to patient well-being and quality of life.

Frequently reported symptoms included difficulty breathing or increased respiratory effort, fatigue, post-exertional malaise, and/or reduced endurance, cognitive impairment or "brain fog," cough, chest pain, headache, palpitations and rapid heart rate, joint pain, muscle pain, tingling sensations, abdominal pain, diarrhea, sleep disturbances including insomnia, fever, dizziness, impaired daily function and mobility, pain, skin rash (e.g., urticaria), changes in mood, loss of smell, or altered taste **(CDC, 2022).**

Tool IV: Coronavirus Anxiety Scale (CAS):

The CAS functions as a self-report instrument comprising 5 items designed to evaluate dysfunctional anxiety related to the coronavirus crisis. Each item on the CAS is rated on a 5-point scale, ranging from 0 (not at all) to 4 (nearly every day), reflecting experiences over the past two weeks. This scaling method aligns with the cross-cutting symptom measure of the DSM-5. A CAS total score equal to or exceeding 9 indicates a likelihood of dysfunctional anxiety linked to the coronavirus. Elevated scores on specific items or a total scale score surpassing 9 may suggest problematic symptoms for the individual, indicating the necessity for further assessment and/or treatment **(Lee, 2020).**

Validity and reliability: Independent studies of adults have demonstrated that the CAS is a reliable instrument (αs > .90). The diagnostic properties of the CAS (90% sensitivity and 85% specificity) are comparable to related screening instruments, such as the Generalized Anxiety Disorder.

Tool V: The 36-item COVID Stress Scales (CSS):

The CSS were created to gain a deeper understanding and evaluate distress related to COVID-19. The scale assesses symptoms of stress and anxiety associated with COVID, covering areas such as (1) fears of danger and contamination, (2) concerns about economic repercussions, (3) xenophobia, (4) compulsive checking and seeking reassurance, and (5) traumatic stress symptoms related to COVID-19. It consists of 36 items, each rated on a 5-point scale ranging from 0 (not at all) to 4 (extremely). The items related to checking and traumatic stress use a 5-point scale ranging from 0 (never) to 4 (almost always) **(Taylor et al., 2020)**.

Validity and reliability: Reliability as internal consistency by Cronbach's coefficient alpha was > 0.80 **(Taylor et al., 2020)**.

Tool VI: Quality of Life (QoL) post COVID-19 pandemic

To assess the effect of the COVID-19 pandemic on QoL, it consisted of 12 items, with five-point ratings on each item from 1–5; therefore, the lowest possible score was 12, and the highest possible score was 60 for the total scale. Low scores represent a lower QoL due to the negative effects of the COVID-19 pandemic **(Algahtani et al., 2021).**

Validity and reliability: The Quality of Life (QoL) post COVID-19 pandemic demonstrated good internal consistency (Cronbach's alpha = 0.81).

Administrative phase:

The Faculty of Nursing, Assiut University, issued an official letter addressed to the director of the outpatient clinic at Assiut University Hospital, seeking permission for

attendance. Subsequently, the study's objectives and data collection schedule were elucidated.

Pilot Study

A pilot study, involving 10% of the total sample, was undertaken to assess the practicability and lucidity of the questionnaire. Furthermore, the pilot study established the time needed for questionnaire completion. Individuals involved in the pilot study were excluded from the primary investigation in accordance with implemented modifications.

Ethical consideration

The research proposal received approval from the Ethical Committee in the Faculty of Nursing. The study application posed no risk to the studied elderly, who were informed of their right to withdraw at any stage. Adhering to standard ethical principles in clinical research, patients were coded for data entry to ensure anonymity. Verbal consent was obtained after explaining the study's purpose, and confidentiality and anonymity were diligently maintained throughout the research.

The Rehabilitative Nursing Intervention:

• The researchers have devised a rehabilitative intervention specifically designed for older individuals recovering from the post-COVID-19 period. The researchers created an informative booklet in straightforward Arabic language after a thorough review of relevant recent literature (**Lung Foundation Australia & the Thoracic Society of Australia and New Zealand, 2021; Sindet-Pedersen et al, 2021).** This booklet comprises uncomplicated instructions and vivid images related to COVID-19, its prevention, and management. This all-encompassing intervention aims to address pain, anxiety, and stress while enhancing the overall quality of life.

• The nursing intervention is tailored to patient-identified needs identified during the pre-assessment stage, integrating activities like inspiratory muscle training, bronchial hygiene exercises, as well as physical exercise training sessions involving quadriceps muscle training and aerobic exercises. It also emphasizes proper nutrition to boost immunity and provides

instructions to prevent recurrent coronavirus infections in the elderly.

• The nursing intervention occurred at the Post COVID-19 outpatient clinic through individualized sessions once weekly for four weeks, during the first week using the study tools in 1st session, pre-program implementation for assessment and explaining the study's aim, followed by three sessions in the second, third and fourth week for implementation the nursing intervention with follow up the patient via phone or WhatsApp to ensure that they adhere to the instructions. Finally, evaluation phase was held in the fourth week.

• Data was gathered from elderly patients with average number 6-7 /week, through four sessions, each session lasted approximately 35–40 minutes. Data collection occurred over a span of seven months, from the first of June 2022 to the end of December 2022.

• **Instructional approaches:** The researchers employed booklet handouts and mobile videos as teaching methods. Additionally, simple pictures and diagrams were utilized to enhance understanding.

Assessment phase:

The researcher assessed elderly patients in 1st session /first week, by using six tools. A structured interview questionnaire (tool 1) was employed to gather data on elderly patients' personal characteristics (part one) and medical history & clinical evaluation (part two). Subsequently, elderly patients underwent assessment using the following standardized tools; tool II: questionnaire for pain rating assessment, tool III: assessment of post-COVID conditions, tool IV: coronavirus anxiety scale, tool V: the 36-item COVID stress scales and finally, tool VI: evaluation of quality of life post the COVID-19 pandemic.

Implementation phase:

- Following the assessment phase, the researcher implemented nursing intervention for each elderly patient. Researchers individually met them, established therapeutic communication, and secured voluntary participation consent by explaining the study's purpose to ensure cooperation.

- The rehabilitative nursing intervention implemented during three sessions in the second, third and fourth week. The average number of cases per day was (6-7) Post COVID-19 elderly patients, scheduled for one day per week (Monday).

- The researchers utilized smartphones and WhatsApp to stay in touch with participants between sessions, offering reminders to enhance adherence throughout the nursing intervention. Additionally, caregivers attended the intervention sessions to assist in reinforcing the nursing instructions for the elderly participants under study.

Content of Rehabilitative Nursing Intervention:

- Theoretical part Included in the program is: (1) an overview of COVID-19 and an explanation of the significance of rehabilitation; (2) education on maintaining a healthy lifestyle, covering aspects such as nutrition, sleep, exercise, and discouraging smoking; (3) promoting the involvement of elderly patients in family and social activities.

- Practical part:

1- Inspiratory muscle training (IMT) sessions: Each individual participated in 15-minute sessions of inspiratory muscle exercises four times a week, with smartphone follow-ups. They were directed to inhale slowly with an elevated tidal rate, taking a brief rest after every 10 inspirations. This sequence of 10 inspirations was repeated five times during each session.

2- Bronchial hygiene exercises: Participants were advised to practice:

a- Diaphragmatic breathing exercises were conducted with a frequency of 20-30 breaths, followed by a 30-60 second rest after every 5 breaths to prevent hyperventilation. The exercises, performed in a semi-sitting or sitting position, involved the researcher placing hands over the epigastric area and guiding patients to focus on slow, deep breaths while keeping the abdomen relaxed.

b- Percussions on the chest wall were executed by cupping the hand to create an air cushion, involving the researcher's hand and the patient during inspiration. Vibrations were applied to the patient's thoracic cage by placing both hands over the percussed regions. Patients were instructed to cough vigorously at the end of each breath and expel secretions into tissue with antiseptic precautions. A 5-minute rest was allowed before proceeding to the next step.

3- The physical exercise training component comprised two daily sessions conducted four times a week, averaging 20 minutes each.

a- Quadriceps muscular training included exercises like quad sets, straight leg raises, heel slides, prone knee bends, wall squats, lunges, quadriceps stretches, and step-ups, each repeated 10 times. Exercise termination criteria included worsening dyspnea, SpO2, and heart rate.

b- Aerobic exercise for patients involved walking, starting from low intensity and gradually increasing intensity and duration, performed 3 to 5 times per week for 20 to 30 minutes each session. Intermittent exercise was suggested for fatigue-prone patients.

c- Balance training for those with balance dysfunction included hands-free and device-assisted balance training under researcher guidance.

The evaluation phase:

The evaluation phase (post-test) occurred after the four-week intervention. The post-test utilized identical assessment tools: clinical evaluation (Tool I), pain rating questionnaire (Tool II), assessment of post-COVID conditions (Tool III), coronavirus anxiety scale (Tool IV), the 36-item COVID stress scales (Tool V), and evaluation of quality of life post the COVID-19 pandemic (Tool VI).

Statistical analysis:

Following verification and preparation for computer entry, the data underwent processing, coding, and tabulation. Descriptive statistics, including number and percentage mean scores, along with standard deviation, were computed using the SPSS version 22 software. To assess disparities in frequency distribution between pre and post-study participants, statistical analyses such as Chi-square, Paired Sample T-test, P-value, and t-value were employed.

Results:

Table (1) presented data showing that the average age of the elderly was 66.08±6.47, ranging from 60 to 85 years. The table also indicated that over half of the elderly participants were female (52.0%). Furthermore, the data revealed that more than two-thirds of the elderly individuals (68.0%) were married. Regarding their residence, a majority of the elderly (70.0%) lived in rural areas, with 88.0% of them residing with family members.

Table (2) showed that there was statistically significant difference between the studied elderly' temperature, blood pressure, pulse and oxygen saturation in pre and posttests (p=<0.001, <0.001, 0.039 & <0.001) respectively.

Figure (1) showed that there were statistically significant differences detected in pain levels among the studied elderly (pre and posttests) (p= <0.001).

Table (3) illustrated that tiredness was the main complain for of post-COVID19 among elderly (100.0%), followed by difficult of breathing (88. 0%) then cough & joint or muscle pain (80.0%). There was statistically significance difference among elderly in all items except difficult of breathing and diarrhea (p=<0.001, 0.044, 0.027, 0.002).

Table (4) showed that the main complaint regarding post Covid anxiety among the elderly patients was abdominal distress (3.38±0.73) in pretest which decreased after the intervention program (0.82±0.6). Moreover, there were statistically significant differences (p= <0.001).

Table (5): illustrated that the most stress complaints were danger (21.66±3.03) followed by xenophobia (20.96±3.23) in pretest while improved after the program (10.32±3.62, 8.04±3.83) respectively. Also, there were statistically significant differences in pre and posttests (p= <0.001).

Table (6) revealed that the quality of life total mean in pretest was 20.44±5.26 while improved after posttest (Mean±SD 44.88±5.51). Furthermore, there were statistically significant differences between pre and posttests (p= <0.001).

Table (7) showed that there was significant positive correlation among pain, stress and anxiety levels at pre and posttests (r value 0.215, 0.169) (r value .479, .463) respectively. In the other side, it was noticed that there was significant negative correlation between quality of life and COVID-19 Stress in pre & posttests (r value -.558, -.708) respectively.

Table (1): Personal Characteristics and Medical History among post COVID 19 elderly patients (n=50)

Personal Characteristics	No	%
Age		
60-69	39	78.0
≥ 70	11	22.0
Mean±SD(range)	**66.08±6.47(60-85)**	
Gender		
Male	24	48.0
Female	26	52.0
Residence		
Urban	15	30.0
Rural	35	70.0
Marital Status		
Single	2	4.0
Married	34	68.0
Divorced	10	20.0
Widow	4	8.0
Education Level		
Illiterate	9	18.0
Read and write	3	6.0
Primary education	14	28.0
Preparatory education	5	10.0
Secondary	15	30.0
University	4	8.0
Occupation		
Retired	19	38.0
Housewife	13	26.0
Farmer	5	10.0
Free work	13	26.0
Medical History ≠		
Hypertension	34	68.0
Diabetes mellitus	38	76.0
Heart disease	28	56.0
Atherosclerosis	13	26.0
Asthma & rheumatoid	8	16.0

≠ More than one answer

Table (2): Clinical evaluation among post Covid-19 elderly patients in pre & post application of rehabilitative nursing intervention (n=50)

Clinical evaluation items	Pretest	Posttest	Mean.DF	T	P.value
	Mean±SD	Mean±SD			
Temperature	37.8±0.64	37.22±0.31	0.57	5.73	0.000**
Systolic blood pressure	140.3±12.63	130±11.56	10.3	4.253	<0.001**
Diastolic blood pressure	90.2±7.14	80.7±6.93	9.5	6.753	<0.001**
Pulse	84.44±14.75	79.26±9.5	5.18	2.09	0.039*
Oxygen Saturation	93.14±2.51	97.34±2.29	-4.2	-8.729	<0.001**

*Paired Sample T-test quantitative data between the two groups *Significant level at P value < 0.05, **Significant level at P value < 0.01*
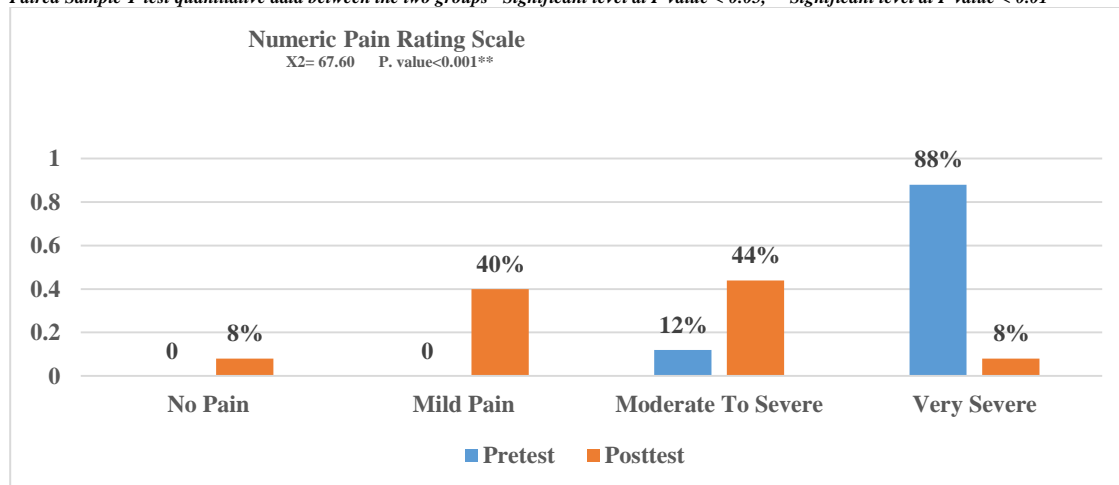

Figure (1): Pain levels among post Covid-19 elderly patients in pre & post application of rehabilitative nursing intervention

-Significant level at P value < 0.01   - Chi square test for qualitative data between the two groups
-Independent T-test quantitative data between the two groups

Table (3): Post-COVID conditions among elderly patients in pre & post application of rehabilitative nursing intervention(n=50)

Post-COVID Conditions ≠	Pretest		Posttest		X2	P. value
	No	%	No	%		
Difficult of breathing	44	88.0	40	80.0	0.670	0.413
Tiredness	50	100.0	37	74.0	12.73	<0.001
Post exertional malaise	38	76.0	5	10.0	41.77	<0.001
Difficult thinking	22	44.0	0	0.0	25.69	<0.001
Cough	40	80.0	19	38.0	16.35	<0.001
Chest or stomach pain	34	68.0	12	24.0	17.75	<0.001
Headache	33	66.0	22	44.0	4.04	0.044
Fast heart beating	18	36.0	2	4.0	14.06	<0.001
Joint or muscle pain	40	80.0	17	34.0	19.74	<0.001
Pins and needle feeling	20	40.0	9	18.0	4.85	0.027
Diarrhea	14	28.0	6	12.0	3.06	0.088
Sleep problems	29	58.0	4	8.0	26.05	<0.001
Fever	28	56.0	1	2.0	32.83	<0.001
Dizziness on standing	27	54.0	9	18.0	12.54	<0.001
Rash	10	20.0	0	0.0	9.00	0.002
Mood change	15	30.0	1	2.0	12.57	<0.001

≠ More than one answer   Chi square test for qualitative data between the two groups
Independent T-test quantitative data between the two group

Table (4): Coronavirus Anxiety among post Covid-19 elderly patients in pre & post application of rehabilitative nursing intervention(n=50)

Coronavirus Anxiety Items	Pretest	Posttest	T	P. Value
	Mean ± SD	Mean ± SD		
Dizziness	2.98±0.8	0.74±0.44	17.40	<0.001
Sleep Disturbances	3.08±0.8	0.78±0.51	17.11	<0.001
Tonic Immobility	3.24±0.74	0.76±0.43	20.39	<0.001
Appetite Loss	3.3±0.68	0.8±0.57	19.94	<0.001
Abdominal Distress	3.38±0.73	0.82±0.6	19.29	<0.001
Coronavirus Anxiety total score	**15.98±3.05**	**3.9±1.67**	**24.59**	**<0.001**

*Paired Sample T-test quantitative data between the two groups   **Significant level at P value < 0.01.*

Table (5): COVID-19 Stress among the studied elderly patients in pre & post application of rehabilitative nursing intervention (n=50)

COVID-19 Stress Subscale	Pretest		Posttest		Mean	T	P. Value
	Mean ± SD	Range	Mean ± SD	Range			
Danger	21.66±3.03	15-24	10.32±3.62	1-18	11.34	16.97	<0.001
Socio-economic consequences	20.8±3.46	12-24	8.24±2.82	0-14	12.56	19.89	<0.001
Xenophobia	20.96±3.23	12-24	8.04±3.83	0-17	12.92	18.24	<0.001
Contamination	20.38±3.6	11-24	7.72±3.83	0-14	12.66	17.04	<0.001
Traumatic stress	19.68±3.43	11-24	8.24±4.04	2-16	11.44	15.27	<0.001
Checking	20.14±4.46	1-24	7.82±3.86	1-14	12.32	14.77	<0.001
Total COVID-19 Stress Scales	123.62±15.87	74-144	50.38±17.63	15-82	73.24	21.83	<0.001

Paired Sample T-test quantitative data between the two groups   Significant level at P value < 0.01

Table (6): Quality of Life of post Covid-19 elderly patients in pre & post application of rehabilitative nursing intervention (n=50)

Quality of Life of post Covid-19	Pretest		Posttest		T	P. Value
	Mean±SD	Mean%	Mean±SD	Mean%		
Rate the impact	2.06±0.55	41.2	3.82±0.6	76.4	-15.35	<0.001
General health	2.02±0.59	40.4	3.8±0.61	76.0	-14.90	<0.001
Feeling of being safe	1.92±0.63	38.4	3.8±0.61	76.0	-15.16	<0.001
Physical environment	1.74±0.53	34.8	3.72±0.67	74.4	-16.40	<0.001
Information needed	1.76±0.56	35.2	3.8±0.7	76.0	-16.14	<0.001
Income	1.76±0.59	35.2	3.84±0.71	76.8	-15.92	<0.001
Access to health service	1.74±0.72	34.8	3.66±0.69	73.2	-13.60	<0.001
Maintain relationship with friends	1.64±0.72	32.8	3.62±0.67	72.4	-14.25	<0.001
Maintain relationship with family	1.44±0.67	28.8	3.74±0.6	74.8	-18.01	<0.001
Support your friends	1.52±0.61	30.4	3.84±0.68	76.8	-17.89	<0.001
Deal with hard time	1.46±0.54	29.2	3.68±0.62	73.6	-19.04	<0.001
Spiritual connections	1.38±0.57	27.6	3.56±0.61	71.2	-18.48	<0.001
Total Mean Quality of Life	**20.44±5.26**	**34.1**	**44.88±5.51**	**74.8**	**-22.69**	**<0.001**

Paired Sample T-test quantitative data between the two groups
Significant level at P value < 0.01

Table (7): Correlation between Coronavirus Anxiety, Quality of Life, COVID-19 Stress and Pain among post Covid-19 elderly patients in pre & post application of rehabilitative nursing intervention (n=50)

Correlations	Pretest				Posttest			
	A1	A2	A3	A4	A1	A2	A3	A4
Coronavirus Anxiety Scale	1				1			
Quality of Life	-0.585[**]	1			-0.727[**]	1		
COVID-19 Stress Scales	0.593[**]	-0.558[**]	1		0.625[**]	-0.708[**]	1	
Pain Assessment Tool	0.215	-0.075	0.169	1	0.479[**]	-0.455[**]	0.463[**]	1

***Statistically Significant Correlation at P. value <0.01**

Discussion:

The global impact of the Covid-19 pandemic has been profound, particularly for the elderly population. Their vulnerability to severe illness is heightened due to age-related physiological changes and underlying health conditions. Following a Covid-19 infection, nursing interventions are crucial to mitigate post-illness complications, reduce anxiety and stress, and enhance overall quality of life **(Ibrahim, 2021 & Guo et al., 2020).**

As for the personal characteristics among COVID 19 elderly patients, it was observed that the mean age of elderly was 66.08±6.47 years, more than half of them were female, more than two thirds of elderly were married, third of them had secondary education. Concerning residence, more than two thirds of them were living in rural areas and the majority of them living with family.

The findings align with **Ibrahim et al.'s (2021)** results, which indicated that approximately half of the elderly participants, with a mean age of 66.57±4.08 years, were included in the study. Additionally, over half of the sample comprised females, and around one-third of the elderly individuals had received secondary education.

Regarding the health history of chronic diseases, more than two third of the studied elderly had hypertension & diabetes mellitus.

This result agreed with **Ibrahim et al, 2021** who reported that two thirds of them had a history of chronic diseases, while nearly half of them are suffered from three chronic diseases or more. Hypertension and heart diseases were prevailing among nearly two thirds of them. These findings are consistent with research conducted in Northwest Ethiopia by **Akalu et al., 2020**, where the study subjects exhibited a higher prevalence of hypertension and heart disease, followed by respiratory diseases. This pattern could be attributed to the typical physiological changes associated with aging in the elderly population.

The primary grievances among elderly individuals post-COVID-19 were evident in challenges related to breathing, pain during breathing, discomfort at rest, localized pain, general fatigue, and impaired mobility. These findings closely align with the results of **Ragab et al., 2021**, the study focused on the impact of a rehabilitation program on dyspnea, physical activities, and psychological well-being in COVID-19 patients. In both studies, a significant proportion of the participants reported experiencing pain during breathing and at rest, localized discomfort, generalized fatigue, and difficulties in movement.

Furthermore, **Husain et al., 2020** supported the notion that individuals experiencing debilitating symptoms post-COVID-19, such as fatigue, chest pain, and muscle pain, should be encouraged to take extended periods of rest. However, they emphasized the risk of physical deconditioning and advocated for a timely return to exercise to prevent long-term impairment following COVID-19 infection.

Examining the impact of a nursing intervention program on pain levels among elderly participants, statistically significant differences were found (p < 0.001). Initially, the majority reported severe pain, which improved

to mild level post-implementation. This aligns with **Ragab et al.,2021** who found significant differences in pain intensity in pre and post-implementation of a the program.

The study revealed a notable improvement in anxiety and stress levels, as well as quality of life among post-COVID older adults after the intervention program. This result was assessed using the Coronavirus Anxiety Scale and the 36-item COVID Stress Scales, with p-values < 0.001. These results were consistent with **Fouad and Gomaa's, 2021** study, emphasizing the impact of social isolation during the pandemic on the mental well-being of elderly individuals.

Liu et al., 2020 also supported the positive effects of a respiratory intervention program on respiratory function, quality of life, and anxiety in elderly COVID-19 patients.

When comparing quality-of-life scores before and after the program for the elderly statistically significant differences were observed (p < 0.001). in the opposite side, **Morteza et al., 2020** noted low quality-of-life scores in COVID-19 patients, particularly in older individuals and those with diabetes.

Similarly, significant differences were found in COVID-19 stress scales before and after the program for the elderly (p < 0.001).

Correlation analysis between the coronavirus anxiety, quality of life, COVID-19 stress, and pain assessment before and after the program for the elderly revealed significant positive correlations in the reduction of pain and anxiety levels in the post-test compared to the pretest. Regarding the quality of life, significant negative correlations were observed between quality of life and COVID-19 stress in the posttest compared to the pretest, indicating that an improvement in quality of life corresponded to a decrease in COVID-19 stress.

These findings align with **Dorene et al., 2021** who also identified a correlation between the coronavirus anxiety scale and quality of life, suggesting that heightened anxiety about the virus negatively impacted the quality of life for the studied sample. This perspective resonates with the idea that heightened anxiety about the viral disease can lead to distress **(Fardin 2020).**

The strength of the study included the study employs a thorough assessment tools which providing a holistic understanding of the elderly participants' well-being. The use of a quasi-experimental design, including pre and post-tests, as well as follow-up assessments, enhances the study's internal validity and allows for the evaluation of the nursing rehabilitation intervention's long-term effects.

On the other side, the study had weakness points the lack of a control group limits the ability to establish a direct causal relationship between the nursing rehabilitation intervention and the observed improvements. The study includes a relatively small sample size of fifty elderly patients, which may impact the generalizability of the findings to a broader population.

Nursing Implications:

The study highlights the importance of educating elderly patients, on the efficacy of nursing rehabilitation interventions in improving the quality of life for elderly individuals recovering from COVID-19, encouraging the integration of such programs into standard care protocols.

Conclusion:

The study revealed significant differences in pain levels, stress, anxiety, and quality of life among elderly individuals with a notable improvement after the intervention program. Importantly, the positive correlation among pain, stress, and anxiety levels emphasizes the interconnected nature of these factors. Furthermore, the study highlights the importance of addressing the holistic well-being of elderly individuals during and after a health crisis.

Recommendations: The results of this study recommended that:

1.Implement continuous educational programs periodically for older adult patients recovering from COVID-19 to enhance their recovery and optimize their Quality of Life.

2.Offering initiative programs through community-based care services is advised to raise public awareness about essential practices such as breathing exercises, physical activity, and psychological support.

3.Further research is needed to explore challenges associated with the post Covid complications and enhancement of resilience among older adults in coping with the stresses brought by COVID-19.

4.Additional research is needed to identify the support mechanisms that enable older adults to engage in self-management practices, aiming to prevent the recurrence of COVID-19 infections.

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