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Effect of Self-Management Intervention for COVID-19 Patients on Their Lifestyle

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ABSTRACT

Background: Corona virus infection (COVID- 19) is highly infectious respiratory pandemic that has caused significant disruption of individuals' daily lives and increased psychosocial distress globally. Self-management interventions are required to control patients' lives addressing three tasks including: Medical and behavioral management, lifestyle management and emotional management.

Objective: This study aimed to evaluate the effect of self-management interventions for covid-19 patients on their lifestyle.

Methods: A quasi-experimental research design was employed in this study. A purposive sample of 90 patients diagnosed with COVID-19, of both sexes, was included. The study was conducted in the isolation units of Tropical Ismailia Hospital and Tropical El-Abassia Hospital. **Tool I:** An interview questionnaire was used to assess participants' demographic data. **Tool II:** A lifestyle patterns scale was administered to evaluate patients' lifestyle behaviors, including diet, exercise, medication adherence, smoking habits, and rest and sleep patterns.

Results: There was highly statistically significant improvement among study group regarding adherence to total patient life style pattern (p 0.000) as (11.1%) of total healthy life style pattern was noticed pre-program and improved to (97.8%) after program implementation.

Conclusion: there was a positive effect of self-management interventions for covid-19 patients on improving lifestyle pattern after implementation of self-management interventions.

Keywords: COVID-19, Lifestyle, Self-management.

INTRODUCTION

Coronavirus disease 2019 (COVID-19), a highly infectious respiratory illness, was first identified in China in December 2019 before rapidly disseminating globally, thereby instigating an unprecedented worldwide public health crisis. The swift escalation in both confirmed case numbers and associated mortalities has demonstrably engendered substantial psychological distress, including elevated levels of stress, anxiety, and depression, among both healthcare professionals and the broader general population [(1)].

As reported by the World Health Organization (WHO), from the onset of the pandemic until November 10, 2024, a cumulative total of over 776.8 million confirmed COVID-19 cases and more than 7 million confirmed deaths were officially reported across 234 countries globally. The preponderance of COVID-19-associated fatalities occurred predominantly during the years 2020, 2021, and 2022. Subsequently, enhanced population immunity has contributed to a notable decline in mortality rates. For the specific period spanning October 14 to November 10, 2024, a total of 77 countries reported COVID-19 cases, with 27 new deaths globally. This timeframe reflects a 39% decrease in reported new cases, totaling over 200,000, and a 36% reduction in new deaths when compared to the preceding 28-day period [(2)].

Lifestyle is conceptualized as a complex, multidimensional construct that integrates a diverse array of personal behaviors. These behaviors typically include, but are not limited to, engagement in physical activity and exercise, effective stress management techniques, the attainment of restorative sleep, the cultivation of robust social support networks, and various aspects of environmental exposure **(3)**. The profound and ongoing COVID-19 pandemic has demonstrably instigated significant disruptions within individuals' daily routines and concurrently exacerbated psychosocial distress on an unprecedented global scale **(4)**. Conversely, the adoption of healthy lifestyle (HL) behaviors has been consistently correlated with a notable reduction in all-cause mortality, alongside an extended lifespan and enhanced overall well-being. Conversely, prevalent unhealthy behaviors, such as the consumption of a poor-quality diet, insufficient physical exercise, and the misuse of tobacco and alcohol, represent major contributing factors to the escalating global burden of disease **(5)**.

The COVID-19 pandemic significantly altered daily routines, leading to patients spending less time engaging in typical daily activities and experiencing a distorted perception of time, often feeling it passed more slowly. This prolonged period of confinement at home likely fostered a more sedentary lifestyle. Such a lifestyle is characterized by excessive time spent sitting or reclining, an increase in screen-based activities like mobile device use, gaming, chatting, and television viewing, and a marked reduction in regular physical activity, leading to

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lower energy expenditure. These behavioral shifts, coupled with potentially increased eating, can have detrimental health consequences. These include an elevated risk for, or worsening of, existing health conditions, alongside a reduction in muscle mass and strength, effects particularly exacerbated in individuals already grappling with obesity [(6)].

Self-management is defined as an individual's capacity to collaboratively address the multifaceted aspects of a disease—including symptoms, treatments, necessary lifestyle modifications, and the associated psychosocial, cultural, and spiritual consequences—in conjunction with their family, community resources, and healthcare professionals [(7)].

Effective self-management interventions typically integrate robust educational resources, provide personalized guidance, and offer continuous support from healthcare professionals. Nurses are pivotal in these interventions, serving as comprehensive care providers, steadfast supporters, and crucial empowerers. Nurses assist patients in establishing realistic health goals, formulating actionable plans, diligently tracking health outcomes, and connecting individuals with appropriate community-based programs. Furthermore, nurses offer essential emotional support, meticulously monitor patient progress, and adapt care plans as needed, all to ensure patients receive optimal care and achieve superior health outcomes [(8)].

AIM OF THE STUDY

The objective of this investigation was to assess the impact of targeted self-management interventions in fostering tangible, positive alterations in the overall lifestyle parameters of individuals who have been diagnosed with COVID-19. This research specifically aimed to ascertain the extent to which such interventions can proactively influence health-related behaviors and well-being within this patient cohort.

Hypothesis: H1: Self-management interventions will demonstrate a statistically significant effect on the lifestyle behaviors of individuals diagnosed with COVID-19.

Research design: A quasi-experimental research design was employed to conduct this study. This particular design was chosen to investigate the intervention's effects while accounting for the practical constraints of a real-world setting, thus allowing for robust inferences about causality.

Study setting: The study took place in the isolation units of both Tropical Ismailia Hospital and Tropical Elabassia Hospitals. At Tropical Ismailia Hospital, the isolation units were segregated by gender, with dedicated male and female units, each accommodating 53 beds. Conversely, Tropical Elabassia Hospital's quarantine units were organized into five distinct sections, each furnished with 20 beds. Within these units, each is further divided into two rooms, with individual rooms containing 10 beds, separated for patient privacy by curtains.

Subject of the study: A **purposive sample** comprising 90 patients with confirmed **COVID-19** was meticulously recruited for this study. Confirmation of COVID-19 diagnosis was rigorously established through a combination of methods, including positive testing of nasopharyngeal or oropharyngeal specimens, characteristic findings on chest computed tomography (CT) scans, and the presentation of specific COVID-19 clinical symptoms. Subsequently, this total sample was randomly divided into two equally sized cohorts: A **control group** and an **intervention (study) group**, each consisting of 45 patients. This allocation was performed in strict adherence to predefined **inclusion and exclusion criteria**

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

N=population size D=error proportion
Z=confidence level P= probability

n = 100 * 0.50 (1 – 0.50) / [100 – 1 * {(0.05)2 / (1.96)2] + 0.50 (1– 0.50)]
=100 * 0.50 * 0.50 / [99 * (0.0025 / 3.841)] + 0.50 * 0.50]
= 100*0.25 / [99 * 0.00065] + 0.25]
= 25 / 0.04485 + 0.25
= 25 / 0.295 = 84.74

Inclusion criteria: Patients' ages from 18-60 years old. Patients able to communicate. Patients newly diagnosed with COVID-19 and admitted to inpatient. Patients accepted to participate in the study.

Exclusion criteria: Patients who are complicated by Covid-19. Patients who had chronic diseases such as cardiac diseases and blood disorders, or cancers.

Tools of data collection:

Tool I: Structured interview questionnaire: To assess socio-demographic characteristics such as age, sex, marital status, level of education.

Tool II: Life style patterns scale: The assessment tool utilized in this study was originally adopted from **Fagerestrom [(9)]**. This foundational instrument underwent a thoughtful modification process by the researcher to better suit the specific objectives and context of the current investigation. Subsequently, its content and structure were rigorously revised by a panel of five subject matter experts to ensure its validity and comprehensive scope in assessing patients' lifestyle

patterns. The modified scale comprehensively encompassed five distinct domains: Diet (comprising 21 items), exercises (4 items), medication adherence (8 items), smoking habits (4 items), and rest and sleeping patterns (5 items).

Scoring system for life style patterns scale: The measurement instrument employed for this study comprised 42 distinct items, utilizing a 3-point Likert scale ranging from "always" to "never" to capture the frequency or regularity of specific lifestyle behaviors. For scoring purposes, the "always" response was consistently assigned two points, the "sometimes" response received one point, and the "never" response was allocated zero points. This yielded a maximum possible total score of 84 points for the entire scale, consistent with the methodology outlined by **Fagerestrom** [9]. Subsequently, these raw total scores were converted into a percentage to standardize interpretation. A participant's lifestyle was classified as healthy if their calculated percentage score was 70% or higher (equivalent to a raw score of 50 points or more). Conversely, a percentage score falling below 70% (i.e., less than 50 raw points) was indicative of an unhealthy lifestyle, as per **Fagerestrom** [9].

Field work: Data collection for this study was systematically conducted across five distinct phases: Preparatory, assessment, planning, implementation, and evaluation. This entire process spanned a 10-month period, started on August 1, 2023, and ended by May 2024.

The preparatory phase: Based on the review of the current national and international-related literature and theoretical knowledge of various aspects of the study using books, websites, articles, and magazine. Permission for data collection and implementation of an educational intervention were obtained from responsible authorities Tropical Ismailia & Tropical Elabassia Hospitals.

Validity of the tools: The content and face validity were reviewed by a jury of five experts in the field of medical surgical Nursing to determine whether the included items are comprehensive, understandable, applicable, clear and suitable to achieve the aim of the study. The needed modifications were done according to the experts' opinions.

Reliability: Reliability of the instrument was rigorously assessed through the calculation of Cronbach's Alpha for the lifestyle patterns scale. Following a meticulous back-to-back Arabic translation process to ensure linguistic equivalence, the resulting Cronbach's Alpha coefficient was determined to be 0.964. This exceptionally high value indicates that the measurement tool possesses excellent internal consistency reliability, thereby confirming its dependability in the current study context.

Pilot Study: A pilot study was systematically conducted, involving 10% of the prospective patient cohort. The preliminary findings derived from this pilot investigation were instrumental in guiding the refinement of the study instruments; consequently, certain items underwent modification, others were omitted, and new items were added to enhance their suitability. Critically, all patients who participated in this pilot study were subsequently excluded from the final study sample to prevent any potential contamination or bias.

Assessment phase (Pre-Test)
Data collection was systematically performed by the researcher utilizing the designated study tools for both the intervention (study) and control groups. Prior to any data acquisition, the researcher formally introduced herself and provided a comprehensive explanation of the study's objectives to all prospective participants. This meticulous approach was undertaken to foster their willing cooperation. Participants were concurrently assured that all information obtained would be maintained under strict confidentiality, and their right to withdraw from the study at any given time would be fully respected without prejudice.

Planning and designing phase:
Based upon comprehensive information obtained from an initial needs assessment of the studied patient population, coupled with an exhaustive review of pertinent scholarly literature, the researcher acquired profound, in-depth knowledge concerning the subject matter. This foundational understanding was instrumental in enabling the meticulous design of the self-management intervention. Subsequently, both the control and intervention (study) groups were individually interviewed to facilitate the systematic collection of all necessary data utilizing the designated study tools. Furthermore, a suite of diverse teaching materials was assiduously prepared by the researcher, incorporating various pedagogical modalities such as didactic lectures, interactive discussions, practical demonstrations, and supervised re-demonstrations. These resources, complemented by engaging PowerPoint presentations and a comprehensive patient booklet, were meticulously crafted to convey both the essential theoretical information and the requisite practical skills for effective self-management.

Implementation phase: The researcher conducted visits to the designated study settings for a duration of two to three days per week, typically from 8:00 AM to 1:00 PM. This schedule was meticulously adjusted to accommodate the fluctuating patient flow rate, with an average daily

recruitment of three to five patients. During these visits, the previously specified data collection tools were consistently employed to gather the requisite information. The structurally planned self-management intervention central to this study was systematically implemented through a series of dedicated sessions. These sessions incorporated a diverse array of teaching methods and media, including interactive discussions, didactic lectures, dynamic PowerPoint presentations, and a visually engaging colored booklet. These varied modalities were specifically chosen to enhance patient engagement and optimize comprehension of the presented information. A total of two educational sessions were delivered, each meticulously designed to last for 30 minutes. The inaugural session commenced with a comprehensive orientation outlining the overarching aim of the study and the specific goals of the self-management interventions. Subsequent sessions, where applicable, initiated with a concise summary of the content covered in the preceding session. Throughout all sessions, participants were actively encouraged to solicit interpretation, elaboration, or explanation of any item presented, fostering a highly interactive and patient-centered learning environment.

Part 1: (Theoretical sessions):

First session was concerned with definition of corona virus, causative agent, manifestations, incubation period, methods of transmission, risk groups, complication, diagnostic methods, and preventive measures to control spread of COVID–19 as well as factors affecting patients' nutrition.

Second session was concerned with individual protective measures, social distancing, environmental disinfection, maintenance of psychological wellbeing and healthy lifestyle.

Evaluation phase (Post- test): Following the complete implementation of the self-management intervention components, a subsequent data collection phase was initiated after a two-week interval. During this phase, all participants were re-interviewed, and data were meticulously recollected utilizing the identical assessment tool employed during the baseline measurement.

Administrative design: To facilitate the execution of this research, official permission was systematically secured from the relevant administrative authorities at both Tropical Ismailia Hospital and Tropical Elabassia Hospital. This critical step was accomplished through the formal submission of a letter, duly signed by the Vice Dean of the Faculty of Nursing for Postgraduate and Research Affairs and the Dean of the Faculty of Nursing. The letter meticulously articulated the comprehensive **objectives of the study**, thereby ensuring full transparency and gaining the necessary institutional approvals for conducting the investigation within these clinical settings.

Ethical considerations: Primary ethical approval for the conduct of this research was duly obtained from The Research Ethics Committee, Faculty of Nursing, Suez Canal University. This approval, designated with ethical code (175/9/2022), formally sanctioned the initiation and execution of the study in accordance with institutional ethical guidelines and all methods were performed in accordance with the ethical standards as laid down in the Declaration of Helsinki and its later amendments or comparable ethical standards.

Statistical analysis

Following the comprehensive collection of all raw data, a rigorous process of data revision and coding was systematically undertaken. Subsequently, the coded data were meticulously entered into the Statistical Package for the Social Sciences (SPSS) software, version 24, for advanced statistical analysis. Concurrently, Microsoft Office Excel software was utilized to effectively construct all necessary graphical representations of the data. Upon completion of this initial data coding phase, additional detailed data manipulation procedures were performed to prepare the dataset for comprehensive analysis. When P value$\leq$ 0.05, there is a statistically significant difference. When P value >0.05, there is no statistically significant difference.

RESULTS

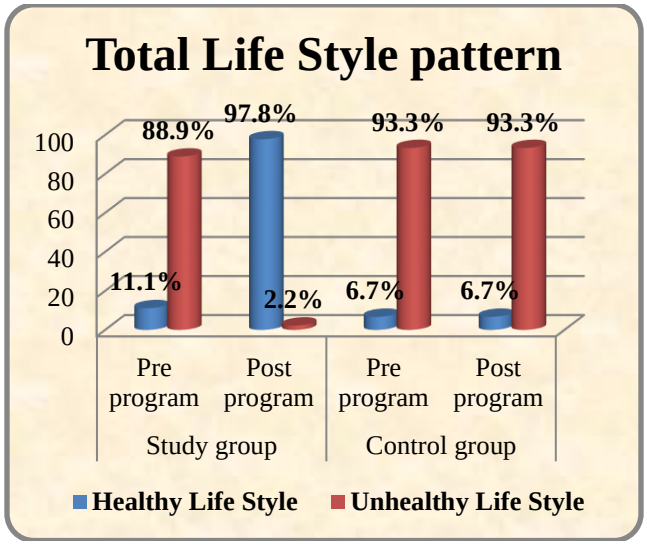

Figure (1) illustrated that there was highly statistically significant improvement among study group regarding adherence to total patient life style pattern as 11.1% of total healthy life style pattern was noticed pre-program and improved to 97.8% after program implementation. While, there was no statistically significant improvement among control group regarding adherence to healthy life style pattern as total life style pattern of control group was unhealthy in 93.3% pre- / post-program implementation.

X^2 1: Between study group preprogram, post program

Chi-square			
X^2 1	**P-value**	**X^2 2**	**P-value**
68.138	0.000**	0.000	1.000

X^2 2: Between control group preprogram, post program.

(A highly statistical significant difference P ≤ 0. 001).**

Figure (1): Frequency and percentage distribution of study and control groups regarding total life style pattern at the pre/ post program implementation phase (n=90)

Table (1) showed the socio-demographic characteristics of the studied groups where 62.2% of study group and 71.1**%** of control group were males. With regard to age, 40.0 % of study group and 71.1% of control group aged 18 < 40 years. Also, the predominant percentage (35.6%) of the study group had university education and 48.8% of control group had basic education. It was apparent that the main percentage of the two groups study and control were married (64.5% & 62.2% respectively). Moreover, there was no statistical significance difference between socio-demographic characteristics of study and control groups except in age.

Table (1): Number and percentage distribution of socio-demographic characteristics of study patients (n=90)

Socio-Demographic Characteristics	Study group (n=45)		Control group (n=45)		Test of significance	
	No	%	No	%	X^2	P-value
Gender						
Male	28	62.2	32	71.1	0.800	0.251
Female	17	37.8	13	28.9		
Age						
18 <40	18	40.0	32	71.1	8.933	0.011*
40 <60	15	33.3	8	17.8		
≥ 60	12	26.7	5	11.1		
Educational Level						
Don't read or write	7	15.6	5	11.1	5.019	0.285
Basic education	13	28.9	22	48.8		
Secondary Education	2	4.4	3	6.7		
University education	16	35.6	12	26.7		
Post graduate	7	15.6	3	6.7		
Marital Status						
Married	29	64.5	28	62.2	0.061	0.970
Divorced	0	0.0	0	0.0		
Widow	5	11.1	5	11.1		
Single	11	24.4	12	26.7		

(* A statistical significant difference P ≤ 0.05).

Table (2) showed that there was highly statistically significant improvement in all items regarding adherence to life style patterns in covid-19 patients (p 0.000) among study group after the self-management program implementation.

Table (2): Mean and standard deviation of study group adherence to life style patterns in Covid-19 care at the pre-/post-program implementation phase (n=45)

Adherence to life style patterns	Max score	Study group		t -test	P value
		Pre program	Post program		
		$\overline{X}$±SD	$\overline{X}$±SD		
Adherence to nutrition	63	14.11±6.41	35.51±1.62	18.13	0.000**
Adherence to exercise	12	1.91±2.06	7.37±0.71	15.58	0.000**
Adherence to medical treatment	24	9.66±2.73	15.60±0.49	17.29	0.000**
Adherence to smoking	12	3.00±2.56	7.00±1.06	18.27	0.000**
Adherence to rest and sleep	15	3.08±2.17	8.80±0.99	16.79	0.000**
Total life style	**126**	31.77±13.98	74.28±3.00	20.48	0.000**

*** A statistical significant difference P ≤ 0.05 **, A highly statistical significant difference P ≤ 0. 001**

Table (3) showed that there was no statistically significant change in all items regarding adherence to life style patterns in covid-19 patients (p 0.620) among control group after the self-management program implementation.

Table (3): Mean and standard deviation of control group adherence to life style patterns in Covid-19 Care at the pre-/post-program implementation phase (n=45)

Items	Max score	Control group		*t*-test	*P* value
		Pre program	Post program		
		$\overline{X}$±SD	$\overline{X}$±SD		
Adherence to nutrition	63	18.77±3.69	20.00±3.08	1.536	0.132
Adherence to exercise	12	2.62±1.31	2.66±1.29	0.381	0.795
Adherence to medical treatment	24	8.02±2.41	8.08±2.35	0.101	0.824
Adherence to smoking	12	3.35±1.40	3.33±1.44	0.155	0.877
Adherence to rest and sleep	15	4.51±1.39	4.53±1.37	0.248	0.978
Total life style	**126**	37.28±7.10	38.62±6.32	0.285	0.620

Table (4) showed statistically significant difference between the study groups demographic characteristics & life style pattern before the self-management program. But, after the program implementation, the significant change was present only with educational level and marital status. There was high statistically significant difference between age and gender and patients' total life style pattern (p 0.000 and 0.001). While, there was statistically significant difference between educational level and marital status and patients' total life style pattern (p 0.038 and 0.029) in the study group preprogram implementation. Also, there was no statistically significant difference between gender & age, and patients' total life style pattern. High statistically significant difference was found between educational level and patients' total life style (p 0.000). Also, statistically significant difference was found between marital status and patients' total life style in the study group after program implementation.

Table (4): Relation between patients total life style and their socio demographic characteristics throughout program phases in the study group (n=45)

Demographic Characteristics		Life style (Study group)					
		Pre program			Post program		
		$\overline{X}$±SD	F/t	P- value	$\overline{X}$±SD	F/t	P- value
Gender	▪ Male ▪ Female	26.78±9.66 40.00±16.27	t= 3.428	0.001**	74.25±2.44 74.35±3.83	t= 0.110	0.923
Age	▪ 18 <40 ▪ 40 <60 ▪ ≥ 60	27.88±6.72 44.20±17.14 22.08±0.99	F= 15.943	0.000**	73.72±3.01 75.40±2.92 73.75±2.95	F= 2.607	0.086
Educational Level	▪ Don't read or write ▪ Basic education ▪ Secondary Education ▪ University education ▪ Post graduate	33.14±17.66 22.69±1.75 41.00±24.04 38.00±16.78 30.42±0.79	F= 2.810	0.038*	77.14±1.06 71.76±1.36 76.50±2.12 75.25±3.06 73.28±2.92	F= 7.570	0.000**
Marital Status	▪ Married ▪ Widow ▪ Single	35.68±15.32 21.20±0.83 26.27±8.29	F= 3.860	0.029*	74.95±2.88 71.00±1.00 74.00±3.03	F= 4.359	0.019*

(* A statistical significant difference P ≤ 0.05 **, A highly statistical significant difference P ≤ 0. 001)

Table (5) displayed no statistically significant relation between demographic characteristics and life style patterns during pre- and post-program implementation except for educational level & marital status at the post-program phase.

Table (5): Relation between patients total life style and demographic characteristics throughout program phases in the control group (n=45)

Socio demographic Characteristics		Life style (Control group)					
		Pre program			Post program		
		$\overline{X}$±SD	F/t	P- value	$\overline{X}$±SD	F/t	P- value
Gender	▪ Male ▪ Female	35.71±4.60 39.88±9.56	t= 1.969	0.055	38.78±7.42 38.35±4.10	t= 0.220	0.803
Age	▪ 18 <40 ▪ 40 <60 ▪ ≥ 60	36.33±4.58 40.46±9.83 34.75±4.90	F= 1.579	0.218	41.72±7.87 36.53±3.62 36.58±4.64	F= 4.118	0.023*
Educational Level	▪ Don't read or write ▪ Basic education ▪ Secondary Education ▪ University education ▪ Post graduate	39.00±3.55 34.07±3.79 39.00±8.48 40.56±8.86 33.57±1.39	F= 2.931	0.067	38.71±2.05 34.92±4.82 39.00±4.24 38.70±3.43 45.00±11.51	F= 3.576	0.014*
Marital Status	▪ Married ▪ Widow ▪ Single	37.58±8.09 33.80±3.83 38.09±5.08	F= 0.688	0.508	38.51±7.36 37.00±4.58 39.63±3.61	F= 0.300	0.742

(* A statistical significant difference P ≤ 0.05 **, A highly statistical significant difference P ≤ 0. 001)

DISCUSSION

Regarding the specific domain of lifestyle, this investigation unequivocally demonstrated a highly statistically significant improvement within the study group concerning their adherence to beneficial lifestyle patterns. In stark contrast, the control group exhibited no statistically significant improvement with respect to their adherence to healthy lifestyle behaviors, underscoring the differential impact of the intervention.

Regarding the specific domain of lifestyle, the present investigation unequivocally demonstrated a highly statistically significant improvement within the study group concerning their adherence to beneficial lifestyle patterns. In distinct contrast, the control group exhibited no statistically significant improvement with respect to their adherence to healthy lifestyle behaviors, underscoring the differential impact of the intervention. These findings align with prior research of **Li *et al.*** [10] who similarly reported notable improvements in lifestyle metrics among their intervention group subsequent to program implementation.

Regarding adherence to nutritional practices among COVID-19 patients, the current study provided robust evidence of a statistically significant improvement within the intervention (study) group following program implementation. Conversely, in the control group, no statistically significant improvements were observed in overall nutritional adherence, with the notable exception of three specific behaviors: Increased consumption of protein-rich foods, a greater avoidance of excessive salt and sugar intake, and a tendency towards consuming a more balanced dinner. This particular finding aligns with a study conducted in Spain by **Fernández *et al.*** [11], who similarly reported substantial improvements in both nutrition and physical activity subsequent to the implementation of their interventions. From the perspective of the researchers, the limited yet statistically significant shifts observed in these specific nutritional behaviors within the control group were likely attributable to the standardized meal policies implemented by the hospital, which inherently influenced patient dietary intake.

Concerning adherence to exercise regimens, the current study definitively demonstrated a statistically significant improvement among the study group post-program implementation. In sharp contrast, the control group exhibited no statistically significant difference in their exercise behaviors among COVID-19 patients over the study period. In the post-program evaluation concerning exercise, a substantial majority of the study group consistently reported avoiding strenuous physical activity, particularly when COVID-19 symptoms were present. This notable shift, evidenced by contrasting pre- and post-program adherence percentages, unequivocally highlighted the efficacy of the implemented educational intervention. Prior to the program, a significant proportion of participants did not adhere to recommended exercise practices, specifically concerning the avoidance of strenuous exertion during symptomatic periods. However, post-intervention, a comparable and now adhering proportion underscored a major and beneficial behavioral transformation.

This finding is strongly corroborated by **Calvo-Paniagua *et al.*** [12] in Spain, who conducted a quasi-experimental study on a telehealth rehabilitation program for hospitalized COVID-19 patients. Their research indicated that adherence to the exercise regimen among their study group was approximately one-third in the pre-program phase, which dramatically increased to approximately four-fifths post-program implementation. Conversely, their control group demonstrated no statistically significant improvement, with roughly one-third of patients adhering to exercise both pre- and post-program implementation.

Regarding adherence to medical treatment, the current study definitively established a statistically significant improvement within the study group following program implementation. In contrast, the control group exhibited no statistically significant difference concerning their adherence to medical treatment among COVID-19 patients. Furthermore, with respect to adherence to smoking prevention measures, the current investigation additionally demonstrated a statistically significant positive difference within the study group subsequent to the implementation of the intervention program. Conversely, the control group exhibited no statistically significant difference in their adherence to smoking prevention practices among COVID-19 patients, highlighting a specific beneficial effect attributable to the intervention. These findings are in strong accordance with the results reported by **Tomaszek *et al.*** [13], who conducted a study in Poland. Their research similarly observed a statistically significant improvement among their intervention group subsequent to program implementation, while concurrently noting the absence of such a statistically significant difference within their control group.

Regarding adherence to rest and sleep patterns, the current study provided robust evidence of a statistically significant improvement within the study group following program implementation. Conversely, the control group displayed no statistically significant difference concerning their adherence to rest and sleep behaviors among COVID-19 patients. These results are further corroborated by the findings of **Altena *et al.*** [14] where their study on "Sleep management in times of a pandemic: A telematic mindfulness-based program during COVID-19" that was conducted in Spain, similarly reported a statistically significant improvement among their

intervention group post-program implementation regarding adherence to rest and sleep.

Pertaining to the relationship between patients' total lifestyle patterns during COVID-19 and socio-demographic characteristics across the program phases, the current study identified a statistically significant difference between educational level, marital status, and total lifestyle pattern in the study group after program implementation. This suggests that the effectiveness of the intervention on lifestyle may have varied based on these demographic factors within the treated group. However, there was no statistically significant difference observed between gender, age, and total lifestyle pattern in the study group after program implementation indicating that these specific demographic variables did not significantly influence the overall lifestyle improvements achieved by the intervention within that cohort.

Furthermore, a statistically significant difference was observed within the control group after program implementation, indicating associations between participants' educational level, age, and their overall lifestyle patterns in the context of COVID-19. Conversely, the study group exhibited no statistically significant differences between gender, marital status, and total lifestyle patterns subsequent to program implementation, suggesting a more universal positive impact of the intervention across these demographic variables. Similarly, **Tomaszek *et al.*** [13] incongruently reported an absence of statistically significant differences in smoking cessation, a critical self-care behavior, when analyzed based on the marital status of patients diagnosed with COVID-19. This contradicts certain assumptions regarding demographic influences on health behaviors. Furthermore, notable discrepancies emerged concerning the influence of age on lifestyle behaviors within the context of COVID-19. Specifically, **Abdelhafiz *et al.*** [15] presented findings that disagree with an age-based association, conclusively reporting no statistically significant relationship between patients' age and the observed lifestyle patterns related to COVID-19 behaviors ($P>0.05$). This indicates a lack of a direct linear correlation between advancing age and adherence to specific health practices in their study.

Correspondingly, **Fernández *et al.*** [11] incongruently reported an absence of a statistically significant relationship between chronological age and general lifestyle adherence observed prior to the implementation of their intervention. This particular finding further underscores and contributes to the ongoing scholarly debates within the existing literature concerning the precise role and influence of various demographic predictors on an individual's propensity for health behavior modification.

CONCLUSION

Based upon the empirical findings derived from the present investigation, a definitive conclusion can be drawn: A substantial majority of the participants within the study group demonstrated significantly improved adherence to a healthy lifestyle pattern subsequent to the implementation of the program and a change evidenced by a robust statistical significance. Conversely, the control group exhibited no statistically significant improvement in their adherence to healthy lifestyle patterns when comparing pre-program to post-program measurements.

RECOMMENDATIONS

Based on results of the present study, the following are recommended:

Designing awareness programs targeting both patients and the broader community about the importance of self-management in dealing with COVID- 19 to enhance their understanding and engagement. Developing mobile application or digital platforms to support the self-management process, offering resources like reminders, virtual consultation, and lifestyle tracking. Including input from health care professionals such as dietitians, psychologists, and physiotherapists to provide holistic interventions addressing physical and mental well-being.

No funding.

No conflict of interest.

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