https://menj.journals.ekb.eg
Print ISSN: 2735-3974
Online ISSN: 2735-3982
DOI: ----------

MNJ
Menoufia Nursing Journal
Faculty of Nursing
Menoufia University

Effect of Motivation Based Nursing Intervention on Physical Activity and Cardiac Self-Efficacy among Patients with Coronary Heart Diseases

Elham S. Elzyen[1], Entsar A. Abd Elsalam[2], Esmat Elsayed Ibrahim[3], Hemat Mostafa Amer[4]

[1]Lecturer of Family and Community Health Nursing, [2]Assist. Prof of Geriatric Nursing
[3] Lecturer of Geriatric Nursing,[4]Assistant professor of Family and Community Health Nursing,
1,2,3,4 Faculty of Nursing, Menoufia University

Abstract: Coronary heart diseases are leading causes of death worldwide. Improvements in physical activity behavior and cardiac self-efficacy are useful to adopt a healthy lifestyle and to promote person-centered care in practice. **Purpose**: to examine the effect of motivation based nursing intervention on physical activity and cardiac self- efficacy among patients with coronary heart diseases. **Design:** A quasi-experimental design (study-control group) was used. **Setting:** The study conducted at the cardiology outpatient clinics in Abo Bakr Elsedik clinics for health insurance at Shebin El-Kom, Menoufia governorate, Egypt. **Sampling:** A purposive sample of 370 (75.1% adults and 24.9% elderly) patients were chosen and equally divided to study-control groups. Instruments: Structured interviewing questionnaire included sociodemographic characteristics, medical data and anthropometric measurements, International physical activity questionnaire and Cardiac self-efficacy questionnaire. **Results:** Motivation based nursing intervention assisted in increasing the physical activity levels and cardiac self-efficacy score; the level of high physical activity among study group increased from 13.0% on pre intervention to 38.9% on post intervention. Also, mean score of cardiac self-efficacy on post intervention was 28.86 ± 8.6 of the study group compared to 20.9 ± 6.6 of the control group. Furthermore, a statistically significant difference was present between adults and the elderly study patients regarding the overall mean score of physical activity post intervention. **Conclusion:** Motivation based nursing intervention had a considerable significant positive effect on the levels of physical activity and cardiac self-efficacy score among adults and elderly patients. **Recommendation:** Motivation based nursing intervention should be incorporated into routine care that is designed for both adults and elderly patients with coronary heart diseases.

Key words*: Coronary heart disease, Cardiac self-efficacy, Motivation based intervention, Physical activity.*

Introduction

Coronary heart diseases (CHDs) are the third most common cause of mortality and morbidity in the world; killing 17.8 million people every year additionally, CHDs have had a substantial negative social and economic impact universally (Roth et al., 2018). The key to enhancing prognosis and lowering mortality in CHDs is standardized management of the condition (Brown et al. 2020). CHDs associated with multitude modifiable risk factors that are the main causes of CHDs which including; poor lipid profile, smoking, being physically inactive, unhealthy dietary

intake, an elevated body mass index (BMI), and high blood pressure (Nurulhuda et al., 2020).

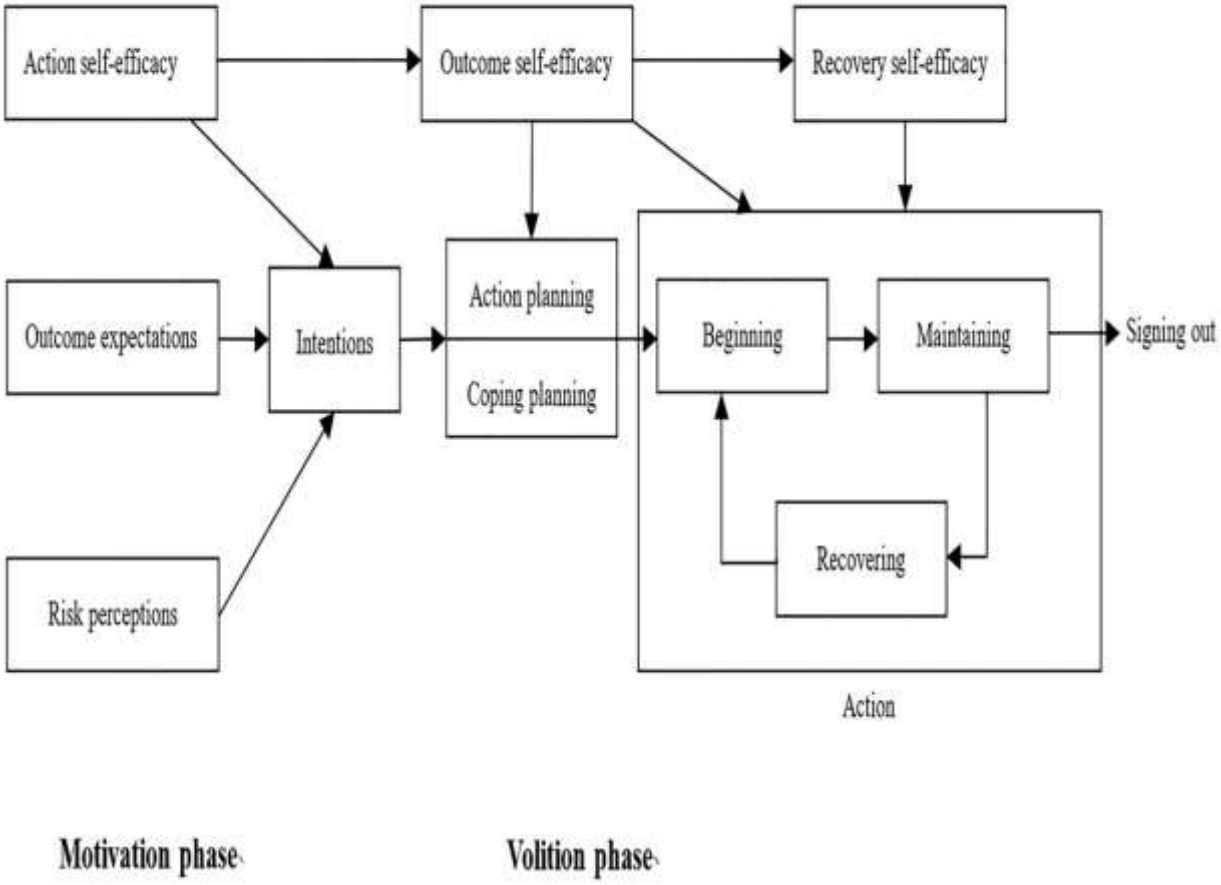
Physical activity is an efficient way for ameliorated quality of life through improving cardiopulmonary function through lowering of elevated blood pressure, total cholesterol and weight (Dai et al., 2018 & Prabhu, 2020). According to a comprehensive reviewing and meta-analysis of 85 a randomised controlled trials that involved adults and elderly with CHDs stated that, engaging in physical activity leads to a significant decrease in cardio-vascular mortality, repeated cardiac episodes and enhancements in the health-related quality of life (Dibben et al., 2021).

Self-efficacy is a characteristic that can be altered and numerous behaviours and lifestyle changes have been shown to increase a patient's level of self-efficacy. An essential factor that associated with efficient lifestyle modulation in persons with chronic conditions is disease-specific self-efficacy (Banik et al., 2018). Cardiac self-efficacy (CSE) is referred to as the capacity of individuals to organise their beliefs, which has been shown to be one of the determinants of physical activity in those having chronic illnesses (Bandura, 1986 & Mendoza-Vasconez et al., 2018).Understanding the reason, course and progression of CHD can be achieved during CSE, quality of life (QoL) and lifestyle changes (Barham et al., 2019).

Programs for cardiac rehabilitation with a variety of facets that include patient education have decreased the risk of death and/or non-fatal cardio-vascular illnesses and enhanced quality of life (Richards et al., 2018). Patient education that substantially correlated with knowledge about medications, cardiac symptoms and lifestyle changes are significant to improve CHDs and other cardiovascular diseases (CVDs) risk factors (Kazem, 2022).

Nurses as one of health care team member are crucial in managing patients with coronary heart diseases. Nursing interventions that appropriately conduct counseling and self-management for patients with coronary heart disease who are anticipated to have self-management abilities in preventing recurrences of emergencies can increase cardiovascular health status (Jiang, et al., 2020). The primary duty of nurses is to educate patients, which has a significant impact on their self-efficacy and helps them become more independent (Salah El-din & El Ashery, 2020).

Health Action Process Approach (HAPA) is social-cognitive paradigm including the motivational and the volitional health behavior determinants. It involves; the motivation and the volition phase, that focuses on initiating plus saving of health behaviors (Zhang et al., 2019).The motivation phase which is the first stage, is essential before a goal is set and needs to be created before people may successfully modify unhealthy behaviors. The volition phase, which is the next stage, is crucial for planning and maintaining health behavior modification. In this phase, people learn how to set priorities, create detailed plans, and turn their action plans to behavior (Schwarzer & Hamilton, 2020).



Jerusalem & Schwarzer, (1992). Self-efficacy as a resource factor in stress appraisal processes. Self-efficacy: Thought control of action, 195213.

Motivation oriented nursing intervention is one type of nursing intervention given to patients with coronary heart diseases. It can enhance the state of a patient's health. Consequently, a theoretical foundation must be used to develop and carry out an appropriate intervention of HAPA to ameliorate; physical activity, self-efficacy specific to cardiac condition and cardiac risk factors among patients suffering CHDs (Son et al., 2020).

Significance of the study:

Coronary heart diseases are the most popular kind of cardiac illnesses; killing 382,820 individuals in 2020 and approximately 20.1 million (nearly 7.2%) adults' aged 20 years and above have CADs (CDC & National Center for Health Statistics, 2022). Around 2 in 10 deaths from coronary artery disease (CAD) in adults fewer than 65 years of age would occur during 2020 (Tsao et al., 2022). In Egypt; according to the WHO reported data in 2020, there are 173,871 deaths from CHDs or 32.40% of all fatalities occurred (WHO, 2020). In addition, World Health Organization statistics estimates that cardio-vascular diseases are the leading causes of death in Egypt, accounting for 40% of total deaths as well Egypt has ranked as one of the very high risk countries for developing coronary heart diseases in adults and elderly worldwide (WHO, 2020 & Reda et al., 2019).

Nurses can play an important role in CHDs prevention and treatment (Ankita, et al., 2022).The use of nurse-

directed care management is quite beneficial in treating both young and older patients with CHDs as well as in reducing risk factors. The success of a nurse in trying to influence a sizable numbers of patients with several risk factors is mostly based on the ability to educate and counsel those who have lack of motivation (Mushtaq & Mir, 2021). Above all, limited studies were conducted in Egypt about different methods of motivations and the resultant effect on physical activity and CSE among patients with coronary heart diseases. For that reason, the present study was conducted to examine the effect of motivation based nursing intervention on physical activity and cardiac self efficacy among patients with coronary heart diseases.

Operational definitions:

Physical activity: based on the motivation nursing action, the patients were encouraged and motivated to perform warming up exercise for 5 minutes, brisk walking for 30 minutes as tolerated, and cool- down exercise for 5 minutes.

Cardiac self-efficacy (CSE): a cardiac-specific behaviours to enhance the patients' self-confidence in his or her potential to bring about certain actions e.g. control symptoms (Control of chest pain by changing activity levels, take heart medications), maintaining function (Maintain the usual social activities and get regular exercises and maintaining healthy life style (Reduce body weight if obese, smoke cessation and follow recommended diet).

Motivation based nursing intervention: is a form of nursing intervention uses health education to motivate the patients to make behavior changes related to physical activity, disease specific self-efficacy and reduce the risk factors of CHDs through face to face preparation and Health Action Process Approach (HAPA).

Purpose of study:

To examine the effect of motivation based nursing intervention on physical activity and cardiac self- efficacy among patients with coronary heart diseases.

Hypotheses:

H1: The patients who receive motivation based nursing intervention (study group); will have higher level of physical activity than the patients who don't (control group).

H2: The patients who receive motivation based nursing intervention; will have increased score of cardiac self-efficacy than patients who don't.

H3: The patients who receive motivation based nursing intervention; will have better improvement in selected risk factors of CHDs than patients who don't.

H4: There will be a statistical significance difference between adults and elderly patients of the study group in relation to cardiac self-efficacy and physical activity pre and post the intervention.

Subjects and method:

Design:

A quasi-experimental design (study-control groups) was used.

Setting:

A study was conducted in the cardiology out patients' clinic in Abo Bakr El sedik clinics for health insurance at Shebin El-Kom, Menoufia governorate, Egypt. This clinic is working daily and provides medical examination, follow-up care and health education services for all patients with cardiac diseases whom have health insurance.

Sampling:

Purposive sample of 370 patients with CHDs was chosen (75.1% adults and 24.9% elderly). A sample randomly selected by simple type to assign the patients into study groups (185 patients were received the intervention) and control groups (185 patients were received usual outpatient care). The studied subjects were chosen according to the following inclusion criteria: adults and elderly patients ages 20 to 69 years of both sexes, who have been diagnosed recently with CHD, had the diagnosis was confirmed by electrocardiogram or angiography within 6 months, received a medical approval from a cardiologist to engage in regular physical activity, no prescribed activities or exercise limitation and freely agree to share in the study. Exclusion criteria: Patients suffering a psychotic disorders and absolute or inability to independently carry out physical activities.

Sample size:

Based on reviewing of the related literature about the prevalence and magnitude of CHDs in Egypt and over the world also, reviewing of the medical records for the patients flow rate at cardiology outpatient clinic. A convenience sample of 370 patients was selected from the above chosen setting. Based on this formula:

$$\text{Unlimited population: } n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

$$\text{Finite population: } n' = \frac{n}{1+\frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2 N}}$$

Where
z is the z score
ε is the margin of error
n is sample size
p̂ is the population proportion
N is the population size

z for a 95% confidence level is 1.96.
p̂ for the population proportion is 0.50
ε for the margin of error is 0.05,
N for the population size is 10000 patients.

$$n = \frac{1.96^2 \text{x} 0.50(1-0.50)}{0.05^2} = 384.16$$

$$n' = \frac{384.16}{1+\frac{1.96^2 \text{X} 0.50(1-0.50)}{0.05^2 \text{x} 10000}} = 370$$

n = (〖1.96〗 ^2 x0.50(1-0.50))/ 〖0.05 〗 ^2 =384.16 patients
n=384.16 / (1+(〖1.96〗 ^2 X0.50(1-0.50))/(〖0.05〗 ^2 x10000)) =370 patients.
Therefore, a sample size of 370 patients would be needed used for carrying out the study.

Instruments:-

Three instruments were utilized to conduct this study.

i. Structured interviewing questionnaire that included the following parts:
   a) Socio-demographic data of CHD patients included: patients' age, sex, marital status, place of residence, educational level, working status and monthly family income .
   b) Medical data included: medication history, and presence of other co-morbidities.
   c) Anthroprometric measurements included: weight and height to calculate Body Mass Index (BMI) determined by (CDC & National Center for Health Statistics, 2003), Measuring blood pressure. Also, a Lipid serum level was acquired from patients' medical records including (cholesterol level, low and high-lipoprotein and triglyceride).

ii. International Physical Activity Questionnaire Short Form (IPAQ-SF) was developed by (Craig, 2003). It utilized in the current study to examine the amount of time used up in walking, engaging in moderate-intensity activity for at least five minutes, and sitting

down as reported by patients. The questions were requested about the time spent being physically active in the last 7 days.

Scoring system: physical activity level calculated and divided according to the metabolic equivalent (M.E.T) criteria to: low or mildly active (M.E.T < 600), moderate activity (M.E.T 600-3000) and high physical activity (M.E.T > 3000). *N.B.* The Metabolic Equivalent (M.E.T) is an estimation of the body's energy expenditure during physical exercise.

Reliability:

Test-retest reliability values ranging from 0.32 to 0.88 and over than three-quarters of studies representing a higher value than 0.65, the original English version of IPAQ-SF had strong reliability.

iii. Arabic Cardiac Self-Efficacy Questionnaire for patients with CHD (CSEQ): is a self-efficacy tool developed by Sullivan et al., (1998) and was translated into Arabic follow a process suggested by the WHO by (Shajrawi et al., 2020). The scale evaluates cardiac patients' a self-monitoring self-efficacy to do lifestyle change and deal with drugs on everyday life. CSEQ involves of sixteen items divided to two sections: control symptoms (eight items), maintain function (five items), and additional three items concerning to healthy lifestyle (dietary habits, smoking and obesity).

Scoring system: a five-point Likert scale where the patients were asked to rate their level of confidence in their knowledge. The responses were categorized as 0= Not confident, 1= confident fairly, 2=moderately confident, 3= high confident and 4=completely confident. Higher scores in the overall mean, which represents a higher level of cardiac self-efficacy**.**

Reliability:

CSEQ has been proven to be a measurement tool that is both valid and trustworthy in patients with CHD (Sullivan et al., 1998). Cronbach's alpha was used to measure internal consistency, and it revealed that the subscales for controlling symptoms and maintaining function both had values of 0.87 and 0.90, respectively.

Instruments' validity:

The international physical activity questionnaire short form and cardiac self-efficacy instrument were translated from English to Arabic by a translation consultant. A panel of five professionals in the areas of medical surgical nursing, family and community health nursing and geriatric nursing were evaluated the content validity of the Arabic version of the instruments. In accordance with the panel's recommendations, differences were reviewed and corrected.

A pilot study:

A pilot research using 10% (37) of patients was done to define the instruments' clarity, appropriateness and the amount of time requirements to fill the questionnaire. Some questions were adjusted and clarified based on the findings of a pilot study.

Ethical considerations:

The ethical research committee approval was taken from faculty of nursing, Menoufia University to conduct the study. All ethical rules were considered. The patients were informed that their participation in the study was voluntary and that they had the liberty to reject; their privacy and confidentiality were preserved. A study goal explained to the study patients and their written consent to share in the study was also obtained.

Procedure:

- Data was collected throughout a six months period starting in February until July 2022.
- Prior to collecting any data, the researchers gave the study's patients, who had consented to take part, a brief explanation of the study purpose. The participated patients were split into the study and control groups.
- The study researchers were available at Abo bakr El-sedik outpatients' insurance clinics about one-two days per week, from 9 am to 12 Pm. Data was gathered according to the following phases (pretest, implementation and posttest):-

- Pre-test phase: the researchers collected data from both groups (study & control) and the data instruments (structured interviewing questionnaire included: sociodemographic data, medical data and selected risk factors measurements, The International Physical Activity Questionnaire and Cardiac Self-Efficacy questionnaire were used. The data gathered was utilized as a baseline evaluation. The average time required to complete the questionnaires was 30-45 min.
- Implementation phase: this phase has two stages; face-to-face preparation and motivation-based nursing intervention stage**.**

Intervention for the study group:

Face-to-face preparation stage: during this stage the researchers conducted an individual health counseling session at the cardiology clinic. The patient's health requirements were identified during this session by evaluating the patient's current state of health, reviewing daily activities, analyzing the difference among activity levels and suggested exercise guidelines and evolving a behavior-specific action plan for behavioral changes. Additionally, the patients will get information about the program, a broad overview, and actual success outcomes.

Motivation-based nursing intervention stage:-

According to the Health Action Process Approach (HAPA) framework, a motivated based nursing intervention was created to begin and maintain n a positive behavioral changes and the significant health consequences in patients with CHDs:-

- In a suitable well prepared room; the intervention was conducted on cardiology health insurance outpatient clinic. Three monthly educational sessions (approximately 15 patients in each group) and an individual telephone follow-up were all conducted one week after the preparatory phase. The researchers were gave a forty min face-to-face education for groups about the nature, signs and symptoms, risk factors, management of CHD and drugs adherence to help an individual's behavioral change.
- The educational booklet included the following topics: the nature of CHDs, symptoms of CHDs, risk factors, a heart-healthy diet, exercise, eliminating smoking, managing stress, medication management, and commitment. The updated international advice and the culturally related national recommendation of CHDs served as the basis for the making of this booklet. In the motivational phase of HAPA, The knowledge gathered throughout the course assisted patients in configuring their desires by increasing perception of risk,

optimistic outcome expectations, and self-efficacy.

- The study groups were given instructions on how to perform home physical exercise e.g. starting with slow background music and a low intensity (40–60 beats per minute). The study groups were told to warm up for 5 minutes before walking. After then, they instructed to walk for 20 minutes at a pace. The motivational part of HAPA was start with the walking exercise, followed by a 5-minute calm-down activity. The study groups were recorded exercise to self-monitoring and follow their exercise practice in and outside home site for sustaining the action and coping with plan of the HAPA.
- The researchers offered a face-to-face group instruction on physical activity and a healthy food for forty minutes. The researchers were provided a 40-minute in group presentation on stress management and quitting smoking on the first day of the ninth week. In addition to the group instruction, study patients were directed to act upon the exercise with moderate effort (warm-up exercise for 5min, rapid walking for 30 min, and cool-down exercise for 5 min). Patients were advised to continue their exercise routine at home, doing so at least three times weekly until the 12-week intervention is full, and doing so with the similar frequency and intensity as they did on the first day of ninth week of the interventions.
- On a regular basis during the period of the study after every week; a 20-minute telephone follow up was made available from the researchers to aid patients get higher motivation to engage in exercise, adhere to a healthy diet, ameliorate their problem-solving abilities to get past perceived obstacles and enhance any positive changes that had occurred. During each phone follow-up, the objective and plan of action were revised and modified as needed for the subsequent review.

Control group:

- Both study and control groups received the standard usual care services for patients with CHDs offered in cardiology outpatient clinics.
- The cardiologist assessed the patient's condition and gave them a 10 to 15 minute an unstructured health education sessions on management of risk factors and stress. Additionally, the patients were told to follow up with the cardiology clinic every month.
- Through the implementation phase for the study groups, the control groups were received a health education sessions on prevention and management of respiratory tract infection and effect of climate change on human health by the researchers.

➢ Post-test phase: - After three months of follow up, the studied patients were interviewed at the cardiology outpatients' clinic using the same data collection instruments to evaluate the effect of the intervention on physical activity level, CSE, and cardiovascular risk factors.

Statistical data analyses:

The Statistical Package for the Social Sciences (SPSS), version 23, was used to enter and analyse the data, the Excel application was used to create the figures. Quantitative data are reported as (X ± SD) and are calculated using the independent sample t test and the Paired t-test to compare two means before and after the intervention. For non-parametric quantitative data (SD > mean), the Mann-Whitney test was

utilised. To depict qualitative data, 2×2 frequency distribution tables of (No. & %) were employed, and the Chi-square ($\chi 2$) test was performed to assess it. For all significant tests, P value 0.05 was used as the level of significance.

Results:

Table 1: illustrates that, the majority of age category of the total sample (75.1%) is adults patients (20-59 yrs) compared with 24.9% for elderly patients (60+yrs) and the mean age among them is 46.8 ±7.6 and 64.1±2.8 correspondingly and there is a statistical significant difference among them (P=0.001). Moreover, the mean age of the study and control groups is 51.6 ± 10.01 and 50.6 ±10.1 respectively with no statistical significant difference. Regarding to sex of the total sample, about 60% and 61.1% is male in study and control groups respectively. Concerning to the marital status, 58.9% of study and 69.2% of control group is married, the main education of the study and control group (42.2% and 66.5%) respectively is secondary education and there is statistical significant difference among them (P=0.001). Also, 74.1% and 71.9% of study and control group correspondingly is employed. Finally, 49.2% and 53.5% of study and control groups respectively their monthly income is not enough.

Figure 1: displays that, 56.8% of the study group have further co-morbidities e.g. diabetes mellitus, hypertension and endocrine disorders while, 55.8% of control group have further co-morbidities.

Figure 2: shows that, 46.60% and 43.80% of the study and control group correspondingly are compliant to take medication on pre intervention. While on post intervention; the medication adherence of the study group is increased to 83.4% comparable to 50.2% of the control group.

Table 2: demonstrates that, a high statistical significant differences are present among study and control groups as regards to the measurements of BMI, blood pressure and levels of serum lipid after intervention than before intervention (P= 0.001).

Table 3: explains that, there is a statistical significant improvement among the study and the control groups as regards to the levels of physical activity after intervention than before (P=0.001). Furthermore, the overall total mean score of physical activity after intervention is 976.7±1221.1, compared to 237.1±122.9 before intervention, with statistically significant differences between the study and control groups (P=0.001).

Table 4: demonstrates that the study group's cardiac self-efficacy subscales mean scores (control symptoms, maintain function, and maintaining healthy lifestyle) are improved after intervention than before intervention, with statistically significant differences between study and control groups. Also, the study group's overall mean score of cardiac self-efficacy was 19.7±7.4 before intervention and 28.8±8.6 after intervention, with statistically significant changes between study and control groups (P =0.001).

Table 5: represents, the total mean score of physical activity of the study group is increased to 976.70±1221.12 on post intervention compared to 237.081±122.87 on pre intervention. As well, the study group's total mean score of cardiac self-efficacy increased to 28.77±8.64 after intervention versus 19.692±7.38 before intervention. Furthermore, there are statistically significant differences in physical activity and cardiac self-efficacy of the

study group between pre and post intervention (P =0.000).

Table 6: demonstrates that there is statistically significant improvement in the total mean score of physical activity after intervention among the studied adults and elderly patients (P =0.002). Nonetheless, there is a considerable improvement in the total mean score of cardiac self-efficacy among the studied adults and elderly patients after intervention compared to before intervention, but no statistically significant differences were observed between them.

Table 1: Distribution of socio-demographic data characteristics between the study and control groups (n =370).

Socio-demographic data characteristics	**Total sample (adults and elderly) (n=370)**				**t- test**	**P value**
	No.	**%**	**Mean ± SD**			
Age category:						
Adults (20 - 59yrs)	278	75.1%	46.766 ±7.554		21.461	0.001*
Elderly (60+yrs)	92	24.9%	64.065±2.812			
Total sample characteristics	**Study (n=185)**		**Control (n=185)**			
	Mean ± SD		**Mean ± SD**			
Mean age	51.56± 10.001		50.58±10.09		0.937	0.349
Sex:						
Male	111	60.0%	113	61.1%	0.045	0.832
Female	74	40.0%	72	38.9%		
Marital status:						
Single	19	10.3%	7	3.8%	7.633	0.054
Married	109	58.9%	128	69.2%		
Divorced	20	10.8%	16	8.6%		
Widowed	37	20.0%	34	18.4%		
Educational level:						
Illiterate	19	10.3%	8	4.3%		
Basic education	38	20.5%	31	16.8%	25.253	0.001*
Secondary education	78	42.2%	123	66.5%		
University education or above	50	27.0%	23	12.4%		
Employment status:						
Employed	137	74.0 %	133	71.9%	7.156	0.028*
Not employed	1	1.0%	7	3.8%		
Retired	47	25.0%	45	24.3%		
Family monthly income:						
Not enough	91	49.2%	99	53.5%	4.694	0.096
Enough	66	35.7%	48	25.9%		
Enough and more	28	15.1%	38	20.6 %		

Figure 1: The co-morbidities distribution among the study and control groups (n=370).

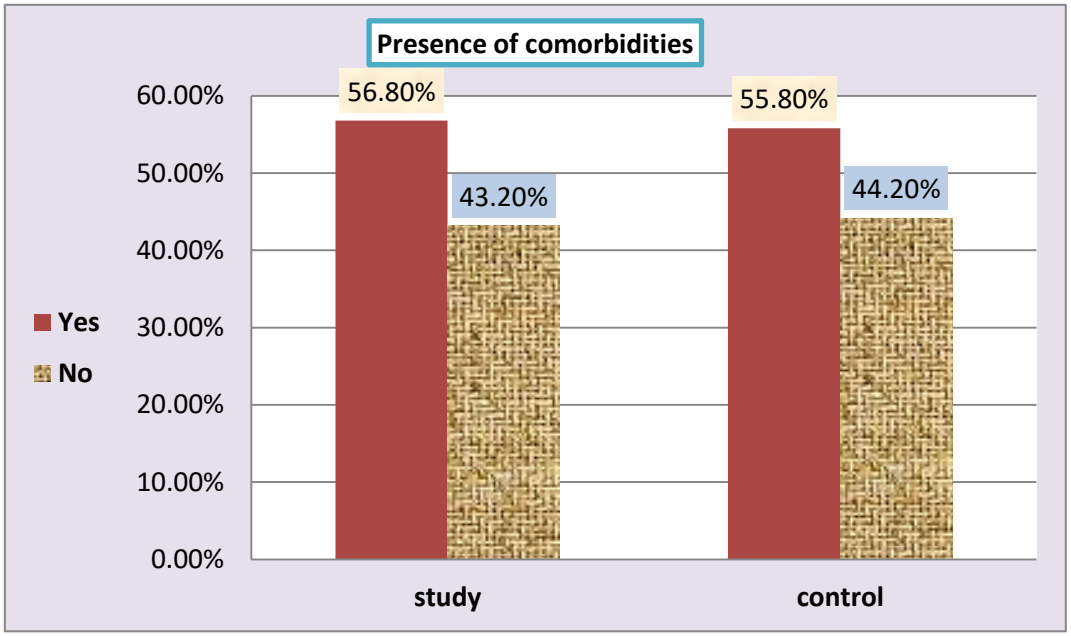


Figure 2: Distribution of patients' medication adherence amongst study and control groups on pre - post intervention (n=370).

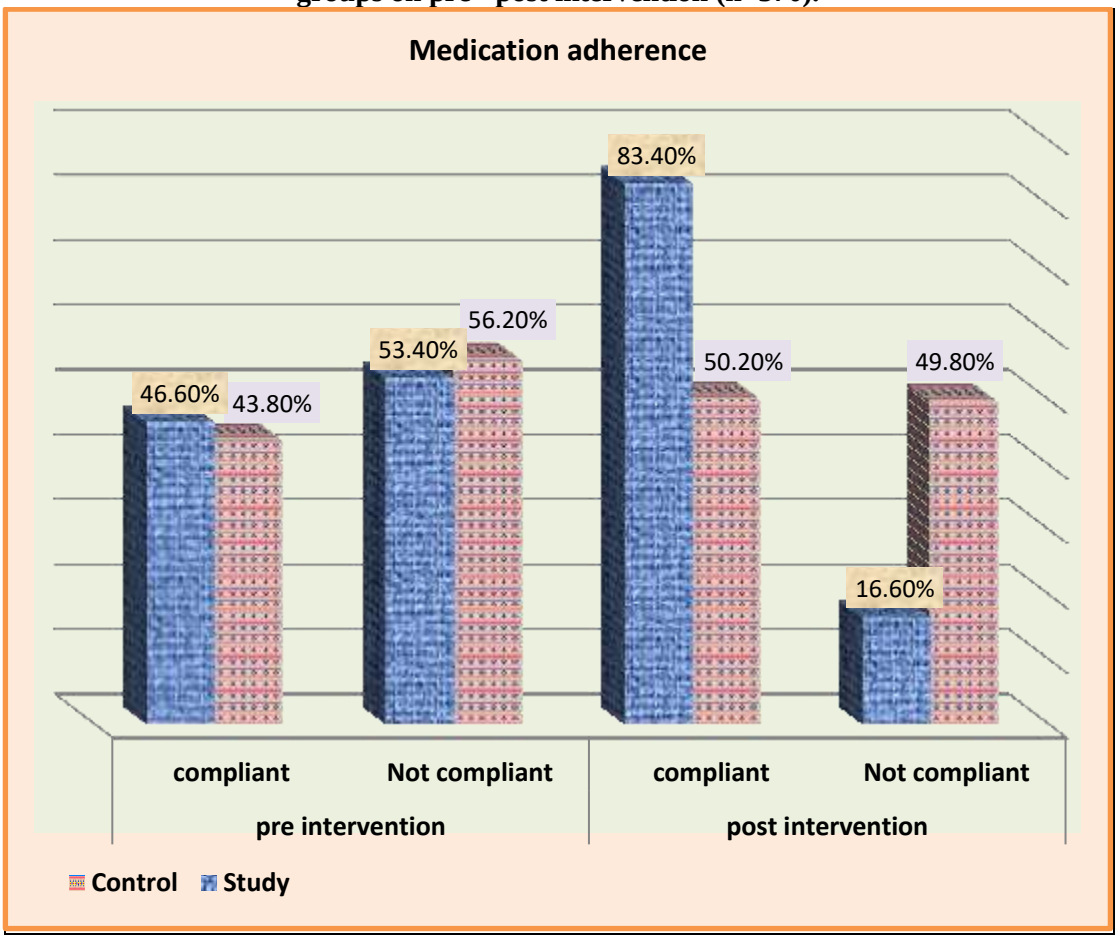


Table 2: Selected modifiable risk factors (RF) of CHDs amongst the study and control groups on pre - post intervention (n=370).

Selected modifiable risk factors of CVD	Study group (n=185)		Control group (n=185)		X^2	P-value	Study group (n=185)		Control group (n=185)		X^2	P- value
	Pre intervention						Post intervention					
	No.	%	No.	%			No.	%	No.	%		
Body Mass Index (BMI)												
Underweight	28	15.1	36	19.5			29	15.7	36	19.5	**25.92**	**<0.001**
Normal	52	28.1	42	22.7	5.89	0.117	97	52.4	50	27.0		
Over weight	71	38.4	85	45.9			49	26.5	83	44.9		
Obese	34	18.4	22	11.9			10	5.4	16	8.6		
Blood pressure (BP)												
≤ 140/90	73	39.5	88	47.6	2.47	0.116	149	80.5	94	50.8	36.27	<0.001
> 140/90	112	60.5	97	52.4			36	19.5	91	49.2		
Serum lipid levels												
Normal	57	30.8	42	22.7	3.11	0.211	106	57.3	50	27.0	38.30	<0.001
High	106	57.3	119	64.3			69	37.3	128	69.2		
Not applicable	22	11.9	24	13.0			7	3.8	10	5.4		

Table 3: Physical activity levels and total mean score amongst the study and control groups on pre - post intervention (n=370).

Physical activity levels	Study group (n=185)		Control group (n=185)		P value	Study group (n=185)		Control group (n=185)		P value
	Pre intervention					Post intervention				
	No.	%	No.	%		No.	%	No.	%	
- **low/mild activity**	133	71.9	137	74.1	**0.809**	43	23.2	81	43.8	**<0.001**
- **Moderate activity**	28	15.1	28	15.1		70	37.8	39	21.1	
- **High activity**	24	13.0	20	10.8		72	38.9	65	35.1	
- **Total mean score**	237.1±122.9		399.1±504.1		**<0.001**	976.7±1221.1		467.03±632.0		**<0.001**

Table 4: The overall total mean scores of cardiac self efficacy and its subscales on pre - post intervention in the study and control groups (n=370).

Cardiac self- efficacy (CSE) subscales	Study group (n=185)	Control group (n=185)	P value	Study group (n=185)	Control group (n=185)	P value
	Pre intervention			Post intervention		
- **Control symptoms (8 Items)**	10.4±3.9	10.7±3.4	**0.50**	13.9±4.9	10.9±3.6	**<0.001**
- **Maintain function (5 items)**	5.3±2.4	5.4±2.03	**0.76**	9.1±5.2	6.04±3.06	**<0.001**
- **Maintaining a healthy Lifestyle (3 items)**	3.9±1.9	3.9±2.02	**0.94**	5.7±1.9	3.9±1.8	**<0.001**
Total mean score of (CSE-16 items)	19.7±7.4	20.04±6.2	**0.62**	28.8±8.6	20.9±6.6	**<0.001**

Table 5: The total mean physical activity and cardiac self efficacy scores of the study group before and after intervention (n=185).

Study variables	Study group (n=185).			
	Pre intervention	Post intervention	t- test	P value
	Mean ± SD	Mean ± SD		
Total mean score of physical activity	237.081±122.87	976.70±1221.12	8.290	.000
Total mean score of cardiac self efficacy	19.692±7.38	28.77±8.64	13.255	.000

Table 6: The total mean scores of physical activity and cardiac self efficacy among studied adults and elderly patients on pre and post intervention (n=185).

Study variables	Studied Adults (n=137)	Studied Elderly (n=48)	P value	Studied Adults (n=137)	Studied Elderly (n=48)	P value
	Pre intervention			Post intervention		
	Mean ± SD			Mean ± SD		
Total mean score of physical activity	235.9±123.5	240.21±122.3	0.838	1142.04±1294.2	504.79±826.8	0.002*
Total mean score of cardiac self efficacy	19.7±7.4	19.7±7.3	0.978	29.03±8.8	28.02±8.31	0.48

Discussion:

Coronary heart diseases are one of the foremost contributors to cardiac related mortality over the globe (World Health Organization, 2020). Lifestyle change includes; physical activity is one of main components of the management for patients with CHDs (Nowbar, 2019). In addition, cardiac self efficacy is considered a crucial changeable individual resource affecting on the treatment adherence, chronic diseases management and outcomes among people with CHDs (Banik, et al., 2018).

Thus, the current study's purpose was to examine the effect of motivation based nursing intervention on physical activity and cardiac self- efficacy among patients with coronary heart diseases.

Regarding to the medications adherence among study and control groups on pre and post intervention, the finding of current study revealed that, fewer than fifty percent of the study and control patients reported compliance to take medication of the CHD on pre intervention. Whereas, post-intervention medication adherence was higher in the majority of the study group compared to the control group. That result was consistent with Saki et al., 2022. According to them, there was a statistically significant difference in the overall mean scores of adherence to the treatment regimen, including medication, in the intervention group.

Furthermore, these findings were also consistent with a study conducted by Wangungu, 2021, who concluded that a statistically significant difference was found in the mean total scores of pre-posttest related to the effect of the educational intervention on medication adherence in patients with CHD. This consistency could be attributed to the fact that, patient-centered education greatly enhanced the adherence to the recommended treatment plan in patients with CHD.

Concerning, the effect of motivation-based nursing intervention on selected modifiable risk factors of CHDs in study and control groups before and after intervention. The current study found that there were strong statistical changes between the study and control groups in terms of BMI, blood pressure, and serum lipid levels post intervention versus pre intervention. This finding goes on the same line with

the finding of a study implemented by (Darshana et al., 2020). They concluded that, the educational intervention enhance the knowledge regarding preventive strategies for CHD risk modifications, weight management and effect of hypo-lipidemic agents. Furthermore, this result is consistent with Kumar et al., 2022. They found that, a systolic and diastolic blood pressure and waist circumference extensively better improved in the post intervention group and highlighted the importance of intervention which directed to manipulate risk factors of CHDs. These similarities could be explained by the fact that the majority of the study sample included the adult patients who had recently received a diagnosis, more motivated to make lifestyle changes to effectively manage their illnesses. The non-pharmacological therapies can also significantly lower changeable risk factors for cardiac diseases.

Regarding to the effect of the motivation based nursing intervention on the levels and total mean score of physical activity among study and control groups before and after intervention. The findings of the current study illustrated that, a statistical significant differences were observed among study and control groups concerning to levels of physical activity post intervention versus pre intervention.

Furthermore, the overall total mean score of physical activity level before intervention was increased after intervention between study and control groups and there has a significant difference between study and control groups on pre and post intervention. These findings agreed well with those of a research conducted by Pitta et al., 2022. They stated that the educational programme could be an effective intervention in increasing habitual physical activity and self-efficacy in persons with coronary artery disease. In addition this result was consistent with a systematic review study conducted by Rahmati-Najarkolaei et al., 2015. They stated that, a positive outcome of the educational intervention about cardiovascular risk factors on nutrition and physical activity were discovered. These similarities could be explained by the fact that a majority of study patients whether in the study or control group employed individuals aged 20 to 59. That gave them the opportunity to continue being physically active.

Regarding to the effect of the motivation based nursing intervention on the total mean score of cardiac self efficacy among study and control groups on pre and post intervention. The current study finding revealed that, on pre intervention; there were no statistical significant differences between study and control groups regarding the total mean scores of cardiac self efficacy and its subscales which included: control symptoms subscale such as controlling the chest pain through changing levels of activity, maintain function subscale "e.g. maintain usual activities with family at home", and maintaining healthy life style subscale "e.g. reduce body weight (if obese)". Although, on post intervention, there were statistical significant differences among study and control group regarding the total mean scores of the cardiac self efficacy subscales and its total mean score. These findings agreed with those of Salah El-din et al (2020). They clarified that a statistically considerable difference in knowledge, CSE, and cardiac exercise self-efficacy on post and follow-up rehabilitative programme intervention was discovered between the study and control groups.

Furthermore, this finding agreed with Tavakolizadeh et al., (2015), who said that there were no statistically significant relationships between control and study group subjects prior to programme implementation. This conclusion was also consistent with Nur'aeni et al., (2019), who stated in their study that a substantial difference in patients' self-efficacy occurred two months following measurement. This consistency may be attributed to the fact that, any improvement in controlling of the disease symptoms and maintaining a healthy life style among study group, results in enhancement of the cardiac self-efficacy among patients with CHDs.

The current study found a statistically significant enhancement in the total mean score of physical activity and cardiac self efficacy in the study group on post intervention in terms of physical activity and cardiac self efficacy total mean scores. This outcome was well similar to the findings of the Pitta et al., 2022 research. They demonstrated that, the educational programme could be a successful intervention for enhancing habitual physical activity and self-efficacy for physical activity in people with CHD. This conclusion is also similar to Nur'aeni et al., (2019), who claimed in their study that the patients' self-efficacy and level of exercise had changed significantly two months after the measurement. This similarity might be explain the fact that, motivation based nursing intervention has the considerable effect on study group including adults and elderly patients in creating a challenge help in changing the undesired behaviours.

Regarding to the existence of statistical significance difference among adults and elderly patients of the study group in relation to CSE and physical activity level on pre - post intervention, The current study concluded that there wasn't a statistically significant difference in total mean scores of physical activity and CSE between adults and elderly patients prior to intervention. In contrast, there was a significant statistical difference in the overall mean score of physical activity between adults and elderly patients after intervention.

However, there wasn't statistical significant difference among the adults and elderly patients in relation to the total mean score of CSE. These results were similar to a study carried out by Tonet et al., 2018. They mentioned that, elderly acute coronary syndrome patients with decreased physical performance benefit from an early, customized low-cost physical activity intervention in terms of their physical performance, quality of life, geriatric status, and outcome. From the researcher point of view; decreased cardiac self-efficacy among the elderly is due to physiological and psychological changes associated with advancing age that affect the functional ability to take care of oneself and distress the motivation to practice any physical activity, in contrast among adults.

On the other hand, this result was discrepancy with the study carried out by Shajrawi et al., 2021. They showed that although cardiac self-efficacy scores improved, participants in Jordan who were recuperating from acute myocardial infarction did not increase their levels of physical activity during this time. These disparities could be explained by the fact that the improvement in CSE was not accompanied by the practical knowledge and skills required to transfer this positive psychological construction into behavioural change that results in an increase in physical activity level.

Conclusion:

Motivation based nursing intervention had a considerable positive influence on the physical activity and CSE score among adults and elderly patients in the study group corresponding to the control group. In addition, the significant improvement in physical activity post intervention was higher among adults than elderly studied patients. The measurements of BMI, blood pressure and serum lipid levels were improved in post intervention than pre intervention. Thus, it was confirmed that the motivation based nursing intervention was effective and influential intervention for dealing with adults and elderly patients with coronary heart diseases.

Recommendations:

- Motivation based nursing intervention should be incorporated into routine care that is designed for both adults and elderly patients with coronary heart diseases.
- Cardiac self-efficacy improvement in patients should be the main goal of nurses at different care settings of adults and elderly people with coronary heart diseases.
- Further educational program that focused on rehabilitation programs for patients with CHDs to increase physical activity level.
- Further research should focus on modifiable lifestyle risk factors and practical ways to reduce them in order to explore the long-term impacts of the intervention in a large population.

Implications for Nursing Practice

According to the HAPA framework, a nursing intervention focused on motivation is used. It appears to be effective in raising CSE and physical activity in adults and elderly patients with CHD. Also, it's anticipated to lessen unintentional hospital admissions, healthcare service costs, nursing faults, and financial strain.

Conflict of interest:

No conflicts of concern were be stated by the authors.

References:

Ankita, A., Kavita, K., Thakur, J. S., Suri, V., &Arora, P. (2022). Nurse-led cardiovascular diseases risk assessment and communication using WHO/ISH risk prediction chart in a tertiary care hospital of North India. Indian Journal of Public Health, 66(3), 367.

Bandura, A. (1986). Social foundations of thought and action. Englewood Cliffs, NJ, 1986 (23-28).

Banik, A., Schwarzer, R., Knoll, N., Czekierda, K., &Luszczynska, A. (2018). Self-efficacy and quality of life among people with cardiovascular diseases: A meta-analysis. Rehabilitation Psychology, 63(2), 295-312.

Barham, A., Ibraheem, R., &Zyoud, S. E. H. (2019). Cardiac self-efficacy and quality of life in patients with coronary heart disease: a cross-sectional study from Palestine. BMC Cardiovascular Disorders, 19(1), 1-12.

Brown, J. C., Gerhardt, T. E., & Kwon, E. (2020). Risk factors for coronary artery disease. StatPearls. Treasure Island, FL: StatPearls Publishing Cardiovascular Translational Research; https://doi.org/10.1007/s12265-019-09938-6. Last access:(8/7/2020 2 PM)

Center of Disease Control and Prevention (CDC) & National Center for Health Statistics. (2003). Prevalence of Overweight among Children and Adolescents:

United States. Retrieved at: December 29, 2003. Available on: http:www.cdc.govnchsproductspubspubdhestatsover99fig1.htm

Centers for Disease Control and Prevention, National Center for Health Statistics. (2022). About Multiple Cause of Death, 1999–2020. CDC WONDER Online Database website. Atlanta, GA: Centers for Disease Control and Prevention.

Craig C.L., Marshall A.L., Sjostrom M., Bauman A.E., Booth M.L., Ainsworth B.E., et al. International physical activity questionnaire: 12-country reliability and validity. Med Sci Sports Exerc. 2003; 35(8):1381–95. https://doi.org/10.1249/01.MSS.0000078924.61453.FB PMID: 12900694

Dai, W., Long, J., Cheng, Y., Chen, Y., & Zhao, S. (2018). Elevated plasma lipoprotein (a) levels were associated with increased risk of cardiovascular events in Chinese patients with stable coronary artery disease. Scientific reports, 8(1), 1-9

Darshana D, Ipseeta Ray M, Sandeep R. (2020). Impact of Educational Intervention on Preventive Strategies for Cardiovascular Disease Risk Modification among Patients with Type II Diabetes Mellitus.Curre Res Diabetes &Obes J; 13(5): 555871. DOI:10.19080/CRDOJ.2020.13.555871

Dibben, G., Faulkner, J., Oldridge, N., Rees, K., Thompson, D. R., Zwisler, A. D., & Taylor, R. S. (2021). Exercise-based cardiac rehabilitation for coronary heart disease. Cochrane Database of Systematic Reviews, (11).https://doi.org/10.1002/14651858.CD001800.pub4 PMID: 34741536

Jerusalem, M., & Schwarzer, R. (1992). Self-efficacy as a resource factor in stress appraisal processes. Self-efficacy: Thought control of action, 195213.

Jiang, W., Zhang, Y., Yan, F., Liu, H., &Gao, R. (2020). Effectiveness of a nurse-led multidisciplinary self-management program for patients with coronary heart disease in communities: a randomized controlled trial. Patient Education and Counseling, 103(4), 854-863.

Kazem, Z. (2022). Association between Enhancing Learning Needs and Demographic Characteristic of Patients with Myocardial Infarction: Iraqi National Journal of Nursing Specialties, 35(2), 17-21.

Kumar, S., Kant, R., Yadav, P., & Kumar, B. (2022). Effect of Non-pharmacological interventions on adults with cardiovascular risk in a rural community. Journal of Family Medicine and Primary Care, 11(9), 5521-5526.

Mendoza-Vasconez, A. S., Marquez, B., Benitez, T. J., & Marcus, B. H. (2018). Psychometrics of the self-efficacy for physical activity scale among a Latina women sample. BMC Public Health, 18(1), 1-10.

Mushtaq, B., & Mir, J., A. (2021). Nurses Role in Coronary Heart Diseases, A Review.Vol-7 Issue-2, IJARIIE-ISSN (O)- 2395-4396.

Nowbar, A. N., Gitto, M., Howard, J. P., Francis, D. P., & Al-Lamee, R. (2019). Mortality from ischemic heart disease: Analysis of data from the World Health Organization and coronary artery disease risk factors From NCD Risk Factor Collaboration. Circulation: cardiovascular quality and outcomes, 12(6), e005375.https://doi.org/10.1161/CIRCOUTCOMES.118.005375 PMID: 31163980

Nur'aeni, A, Mirwanti, r., & Anastasia, A. (2019). Effect of A Workbook in Health Education on Self-Efficacy and Quality of Life of Patients with Coronary Heart Disease. Belitung Nursing Journal; 5(6): 218-224.

Nurulhuda, M. H., Norwati, D., &Mazubir, N. N. (2020).Clustering of lifestyle cardiovascular risk factors among healthy government servants in Kuala Terengganu: who and what to target. Asian Journal of Medicine and Biomedicine, 4(1), 53-60.

Pitta, N. C., Furuya, R. K., Freitas, N. D. O., Dessotte, C. A. M., Dantas, R. A. S., Ciol, M. A., & Rossi, L. A. (2022). Effect of an educational program on physical activity in individuals undergoing their first percutaneous coronary intervention: A randomized clinical trial. Brazilian Journal of Physical Therapy, 26(5), 100443.

Prabhu, N. V., Maiya, A. G., & Prabhu, N. S. (2020). Impact of cardiac rehabilitation on functional capacity and physical activity after coronary revascularization: a scientific review. Cardiology research and practice, 2020.

Rahmati-Najarkolaei, F., Ghaffaipasand, E., Fesharaki, M. G., &Jonaidi-Jafari, N. (2015). Nutrition and physical activity educational intervention on CHD risk factors: a systematic review study. Archives of Iranian medicine, 18(1), 51-57.

Reda, A., Ashraf, M., Bendary, A., Elbahry, A., Farag, E., Bendary, M., Tabl, A., Mostafa, T., Wadie, M., & Selim, M. (2019). Premature Coronary Artery Disease among Egyptian Patients with The Acute Coronary Syndrome; Data From The Cross-Sectional Cardio-Risk Project. Egyptian Association of Vascular Biology and Atherosclerosis (EAVA). European Heart Journal; 40 (1): 440.

Richards, S. H., Anderson, L., Jenkinson, C. E., Whalley, B., Rees, K., Davies, P., & Taylor, R. S. (2018). Psychological interventions for coronary heart disease: Cochrane systematic review and meta-analysis. European journal of preventive cardiology, 25(3), 247-259.

Roth, G. A., Abate, D., Abate, K. H., Abay, S. M., Abbafati, C., Abbasi, N., & Borschmann, R. (2018). Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980–2017: a systematic analysis for the Global Burden of Disease Study 2017. The Lancet, 392(10159), 1736-1788.

Saki, M., Najmi, S., Gholami, M., Ebrahimzadeh, F., & Pour, F. J. (2022).The effect of patient-centered education in adherence to the treatment regimen in patients with coronary artery disease. Journal of Vascular Nursing, 40(1), 28-34.

Salah Eldin S. N., & El Ashery A. A. R. (2020). Effect of Digital Cardiac Rehabilitation Program on Self Efficacy of Patients with Coronary Artery Diseases. Egyptian Journal of Health Care, 11(1), 400-416.

Schwarzer, R., & Hamilton, K. (2020).Changing behavior using the health action process approach. The handbook of behavior change, 89-103.

Shajrawi, A., Khalil, H., Al Smadi, A.M, Al Dweik, G., Slater, P., Granat, M., Jones, I. & Astin, F. (2020). A cross-cultural translation and adaptation of the Arabic Cardiac Self-Efficacy

Questionnaire for patients with coronary heart disease. International Journal of Nursing Practice, 26 (4).

Shajrawi, A., Granat, M., Jones, I., &Astin, F. (2021). Physical activity and cardiac self-efficacy levels during early recovery after acute myocardial infarction: A Jordanian study. The Journal of Nursing Research, 29(1), e131.

Son, Y. J., Choi, J., & Lee, H. J. (2020). Effectiveness of nurse-led heart failure self-care education on health outcomes of heart failure patients: A systematic review and meta-analysis. International journal of environmental research and public health, 17(18), 6559.

Sullivan, M. D., Lacroix, A. Z., Russo, J., &Katon, W. J. (1998). Self-Efficacy And Self-Reported Functional Status In Coronary Heart Disease: A Six-Month Prospective Study. Psychosomatic Medicine 60(4), 473-478. Http://Dx.Doi.Org/10.1097/00006842-199807000-00014

Tavakolizadeh, J., Tabari, J., &Akbari, A. (2015). Academic Self-Efficacy: Predictive Role of Attachment Styles and Meta-Cognitive Skills, Procedia - Social and Behavioral Sciences; 171: 113 – 120.

Tonet, E., Maietti, E., Chiaranda, G., Vitali, F., Serenelli, M., Bugani, G., &Grazzi, G. (2018). Physical activity intervention for elderly patients with reduced physical performance after acute coronary syndrome (HULK study): rationale and design of a randomized clinical trial. BMC cardiovascular disorders, 18(1), 1-9.

Tsao, C. W., Aday, A. W., Almarzooq, Z. I., Alonso, A., Beaton, A. Z., Bittencourt, M. S., ... & Martin, S. S. (2022). American heart association council on epidemiology and prevention statistics committee and stroke statistics subcommittee. Heart disease and stroke statistics-2022 update: A report from the American Heart Association. Circulation, 145(8), e153-e639.

Wangungu, E. (2021). The Effect of an Educational Intervention on Medication Adherence in Persons with Coronary Artery Disease.

World Health Organization (WHO), (2020). The top 10 causes of death. [Internet].. https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death

Zhang, C. Q., Zhang, R., Schwarzer, R., &Hagger, M. S. (2019). A meta-analysis of the health action process approach. Health Psychology, 38 (7), 623. https://doi.org/10.1037/hea0000728.