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The Effect of the Instructional Program of Health-related Behaviour on Socio-demographic Variables for Patients with Chronic Diseases

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ABSTRACT

Background: The current study, a continuation of a previous study, explores the relationship between sociodemographic factors and health behaviours among chronic disease patients in Diwaniyah City, Iraq. **Objectives:** To evaluate the effect of the instructional program of health-related behaviour on socio-demographic variables for patients with chronic diseases. **Methods:** A quasi-experimental study was conducted on 222 chronic disease patients using a structured questionnaire. Data analysis included descriptive and inferential statistics. **Results:** The findings revealed significant associations between sociodemographic variables and health behaviours. Education level and income were positively correlated with healthier behaviours, while age and gender influenced specific health behaviours. **Conclusion:** The present study emphasises the need for targeted health promotion programs that consider sociodemographic variables to improve health outcomes among chronic disease patients.

Keywords: Chronic Disease; Health Behaviours; Sociodemographic Variables

INTRODUCTION

Sociodemographic factors influence health behaviours among chronic disease patients (Maccido, 2024). The Health Promotion Model explains individuals' health-promoting behaviours (Pender, Murdaugh & Parsons, 2015). Secondary theories explain the influence of social and environmental factors on health behaviours (Ajzen, 1991). The Health Promotion Model can help understand the factors influencing health behaviours (McLeroy *et al*., 1988). This research aims to investigate the influence of sociodemographic factors on health behaviours and explore strategies to improve them (Oster & Chaves, 2023). Higher education and income are correlated with healthier lifestyle behaviours (Sallis, Owen & Fisher, 2015; Kardan *et al*., 2024). Older adults are less likely to engage in physical activity compared to younger individuals (Ali & Qassim, 2023; Khleel & Mohammed, 2021).

Health education programs should be tailored to address the specific needs of various populations (CDC, 2019). Chronic diseases pose a significant global health burden (WHO, 2013; Su *et al*., 2023). Adopting healthy behaviours can improve health outcomes and quality of life for individuals with chronic diseases (Garvey, 2023). Regular physical activity, a balanced diet, and stress management are essential for a healthy lifestyle (Khemka *et al*., 2023; Alkasab & Aziz, 2023). Sociodemographic factors influence health behaviours, with age, gender, education, and income playing significant roles (Mousa & Mansour, 2020; Hussain & Mohammed, 2021; Al Omari *et al*., 2024). Education level is a significant predictor of health-related behaviours (Benjamin *et al*., 2019; Al-Mayahi, Al-Jubouri, & Jaafar, 2023; Shinjar, Bakey & Khudur, 2018; Al-Ganmi *et al*., 2018). Income level, marital status, social support networks, environmental factors, and cultural beliefs influence health behaviours, and understanding these factors is crucial for designing effective and culturally tailored health interventions (Ahmed, Naji & Younis, 2023; Athbi & Hassan, 2019). The study aims to assess the effect of the Instructional program of health-related behaviour on socio-demographic variables for patients with chronic diseases.

Hypotheses

Null Hypothesis (H0): The instructional program of health-related behaviour has no significant effect on the health-related behaviours of patients with chronic diseases, regardless of their socio-demographic variables.

Alternative Hypothesis (H1): The instructional program of health-related behaviour has a significant positive effect on the health-related behaviours of patients with chronic diseases, influenced by their socio-demographic variables.

METHODOLOGY

Design

A quasi-experimental design was conducted to fulfil the purpose of the study.

Settings

The study was conducted in Diwaniyah City, Iraq, within healthcare facilities that cater to chronic disease patients.

Subjects

The study subjects comprised a purposive sample of 222 adult male and female patients with chronic diseases, equally divided into study and control groups. All studied patients were selected according to the following criteria:

Inclusion Criteria

Adults aged 18 and older with chronic diseases who can read, write, and consent to participate.

Exclusion Criteria

Patients with acute illnesses, chronic mental health disorders, or those who decline participation or are absent from the program.

Sample Size Calculation

A G-Power analysis determined a sample size of 222 patients with chronic diseases, equally divided into study and control groups, selected using non-probability purposive sampling.

Tools of Data Collection

A structured interview questionnaire to assess sociodemographic characteristics. The Health Promotion Lifestyle Profile II (HPLP II) assesses health-related behaviours (Pender, Murdaugh & Parsons, 2015).

A pretest-posttest design will be used to evaluate the impact of a five-session health promotion program on health-related behaviours in the study group, with follow-up assessments at one and two months. Sociodemographic data and HPLP II will be collected from both groups, analysed using descriptive and inferential statistics, and compared between the three phases. The study was conducted from August 1 to November 1, 2024.

Statistical Analysis

All statistical analyses were conducted using a significance level of 0.01 (two-tailed), corresponding to a 99% confidence level. Paired sample t-tests were utilised to examine test-retest reliability, while independent samples t-tests were employed to evaluate differences between study and control groups for continuous variables such as age and BMI. For categorical variables, including gender and marital status, the Chi-square test was applied to assess group equivalency and successful randomisation. A p-value > 0.05 was interpreted as indicative of no statistically significant difference between groups.

Mean scores (M) were calculated for each domain of health behaviour, including Health Responsibility (HR), Physical Activity (PA), Nutrition (N), Spiritual Growth (SG), Interpersonal Relationships (IR) and

Stress Management (SM). These scores collectively contributed to an overall health score, representing a general index of individual health behaviour.

Correlation analyses were conducted to determine the strength and direction of relationships between sociodemographic variables and health-related behaviours. Pearson's correlation coefficients (r) were interpreted based on the following classification for both positive and negative correlations are very weak-0.00–0.20, weak- 0.21–0.40, moderate- 0.41–0.60, good- 0.61–0.80 and excellent- 0.81–1.00.

Significant correlations were defined as those with p-values <0.01 (two-tailed), indicating statistical significance at the 99% confidence level. Effect sizes for the paired sample t-tests were calculated using Cohen's d, with interpretation thresholds sets are small- 0.2, medium- 0.5 and large- 0.8.

These analyses were used to evaluate the consistency of measurements over time (test-retest reliability), differences between experimental and control groups and associations between health behaviours and demographic factors.

Nursing Implications

Nurses play a vital role in chronic disease management, providing holistic care, education, support and collaboration to improve patient outcomes.

Content Validity

Five community health nursing experts evaluated the tools for comprehensiveness, applicability, clarity, relevance, and comprehension to conduct content validity. No changes were made when needed.

Pilot Study

Ten percent of patients in the sample participated in a pilot study to make sure the questions were clear, the instruments were applicable, and the time required to complete them was adequate. No ambiguous statements or questions were present, and no changes were made. Pilot study was included in the study.

Field Work

Fieldwork was conducted in healthcare facilities in Diwaniyah City, where data collection took place over the specified study period.

Implementation of the instructional program included four phases (assessment phase, planning phase, implementation phase, and evaluation phase)

Assessment Phase

The researcher initially established a friendly relationship with the patients by having brief talks with them. Every patient was interviewed before the program was conducted to gather the patients' data utilising tool and Tool II was used to assess the patients' health-related behaviour.

Planning Phase

In response to the patients' practical demands, knowledge gaps and health-related behaviour among chronic disease patients, the goals, priorities, and expected results were defined based on the results of the preceding phase. For the patients under study, the researchers designed five sessions—two theoretical and three practical.

The Instructional Program

They created and updated an instructional program. It featured presentations on chronic disease, both theoretical and clinical.

The general and specific objectives of instructional program sessions

At the end of the instructional program sessions, the chronic disease patients were expected to acquire knowledge and practices.

Some specific objectives of the instructional program are to provide participants with a comprehensive understanding of chronic diseases. It aims to identify the causes and risk factors of chronic disease and recognise their common signs and symptoms. The program also focuses on identifying potential complications that may arise from chronic diseases and understanding the diagnosis of these conditions. Furthermore, it will discuss the available management and treatment options, as well as strategies for prevention. Lastly, the program will guide individuals to properly prepare for exercise and follow appropriate dietary practices to support overall health and well-being in the context of chronic disease management.

Implementation phase

After assessing the level of knowledge and practice among chronic disease patients, the investigator conducted the pretest by using knowledge and practice assessment tools. The investigator obtained consent from the selected samples before the study and their data were also collected.

This study aimed to evaluate the effect of the instructional program of health-related behaviour on socio-demographic variables for patients with chronic diseases and was aimed at improving patients knowledge and practice of health-related behaviour among chronic disease patients through five sessions, including two theoretical and three practical sessions for about 30-45 minutes each. The researchers began every session by gathering input regarding the preceding one, and they concluded each one with a recap. From 9 a.m. to 12 p.m., three days a week, the researchers were accessible in the study settings. The previously indicated study techniques were used for one-on-one interviews with each patient.

Following a review of the relevant literature based on an assessment of the actual needs of the patients under study, a simplified booklet was used as supportive material and provided to patients in Arabic. It covered all items regarding the knowledge and practice of chronic disease. A variety of instructional techniques, including lectures, brainstorming sessions, small-group discussions, visuals, demonstrations, and re-demonstration in the education setting. A variety of instructional tools were employed, including flipcharts, PowerPoint, figures, handouts, and animated films explaining chronic disease.

The instructional program's theoretical and practical sessions were done as follows:

The first session (theoretical) began with the researchers introducing themselves, wishing the patients happy participation in the study, and outlining the goals of the instructional program. The following topics were reviewed in the first session: definition, causes, risk factors, signs and symptoms, and complications related to chronic disease. The topics discussed in the second (theoretical) session included the diagnosis, prevention, and treatment of chronic disease. In the third session (practical), this course covered the administration, therapy, and avoidance of problems associated with chronic disease. In the fourth session, which was practical, patients were clinically demonstrated and re-demonstrated how to prepare for performing exercises and health-related behaviour of diet. These exercises were created by the researcher in response to the patient's lack of knowledge and practices. Finally, fifth session (practical) began with gathering data regarding the preceding sessions and addressing any queries regarding chronic disease, exercise types and frequencies, lifestyle modifications, and healthy diet. After giving out the post-test to each participant's patients, the researcher expressed gratitude for their participation in the study

Evaluation Phase

This phase aimed to evaluate the effect of the instructional program of health-related behaviour on socio-demographic variables for patients with chronic diseases. This was done by giving a post-test with similar tools to the pretest one month and two months later.

Ethical Consideration

The researchers obtained ethical approval from the Al Diwaniyah Health Directorate, Iraq, with reference number 227 on 2nd June 2024.

Informed consent was obtained from all participants prior to their inclusion in the study. Participants were assured of their right to withdraw from the study at any time without any repercussions. Confidentiality and anonymity were maintained throughout the research process, ensuring that personal information was securely

stored and only accessible to the research team.

RESULTS

Table 1: Frequency Distribution of the Sociodemographic Characteristics of the Study and Control Groups (n222)

| Socio-demographical Characteristics		Study Group (n=111)		Control Group (n=111)		Value
		f	%	*f*	%	0.217-3.068
Age	30-39	8	7.2	9	8.1	
	40-49	15	13.5	8	7.2	
	50-59	32	28.8	25	22.5	
	60-69	30	27.0	43	38.7	
	70-79	25	22.5	26	23.4	
	Total	111	100.0	111	100.0	
Sex	Male	69	62.2	83	74.8	0.556-0.372
	Female	42	37.8	28	25.2	
	Total	111	100.0	111	100.0	
Education Level	Reads and writes	11	9.9	11	9.9	0.070-8.722
	Primary	20	18.0	14	12.6	
	Medium	22	19.8	18	16.2	
	Preparatory	19	17.1	16	14.4	
	Institute	17	15.3	23	20.7	
	College	17	15.3	22	19.8	
	Higher Diploma	1	0.9	3	2.7	
	Master	3	2.7	2	1.8	
	PhD	1	0.9	2	1.8	
	Total	111	100.0	111	100.0	
Marital Status	Single	5	4.5	4	3.6	0.165 -1.983
	Married	90	81.1	83	74.8	
	Divorced	5	4.5	6	5.4	
	Widow	8	7.2	13	11.7	
	Separated	3	2.7	5	4.5	
	Total	111	100.0	111	100.0	
Occupation	Employee	51	45.9	54	48.6	0.178 -6.171
	Earner/Freelancer	17	15.3	20	18.0	
	Retired	16	14.4	16	14.4	
	Unemployed	16	14.4	17	15.3	
	Housewife	11	9.9	4	3.6	
	Total	111	100.0	111	100.0	
Work Per Week	Fulltime >=35 hr	17	15.3	22	19.8	0.165 - 6.159
	Part time 15-34 hr	12	10.8	17	15.3	
	Part time<15 hr	42	37.8	44	39.6	
	Not Working	40	36.0	28	25.2	
	Total	111	100.0	111	100.0	
Place of Residence	Urban	92	82.9	84	75.7	0.543-0.364
	Rural	19	17.1	27	24.3	
	Total	111	100.0	111	100.0	
Monthly Family Income (IQD)	Less than 300,000	21	18.9	35	31.5	0.063-7.634
	300,000-600,000	33	29.7	22	19.8	
	601,000-900,000	31	27.9	38	34.2	
	901,000-1,200,000	23	20.7	9	8.1	
	1,201,000-1,500,000	2	1.8	6	5.4	
	1,501,000 or more	1	0.9	1	0.9	
	Total	111	100.0	111	100.0	

f –Frequency, % Percentage; IQD- Iraqi Dinar

Table 1 presents the frequency distribution of sociodemographic characteristics of the study and control groups, including age, sex, education level, marital status, occupation, work hours, place of residence and monthly family income. The data indicates a balanced representation of participants across various demographics, which is essential for understanding the influence of these factors on health behaviours.
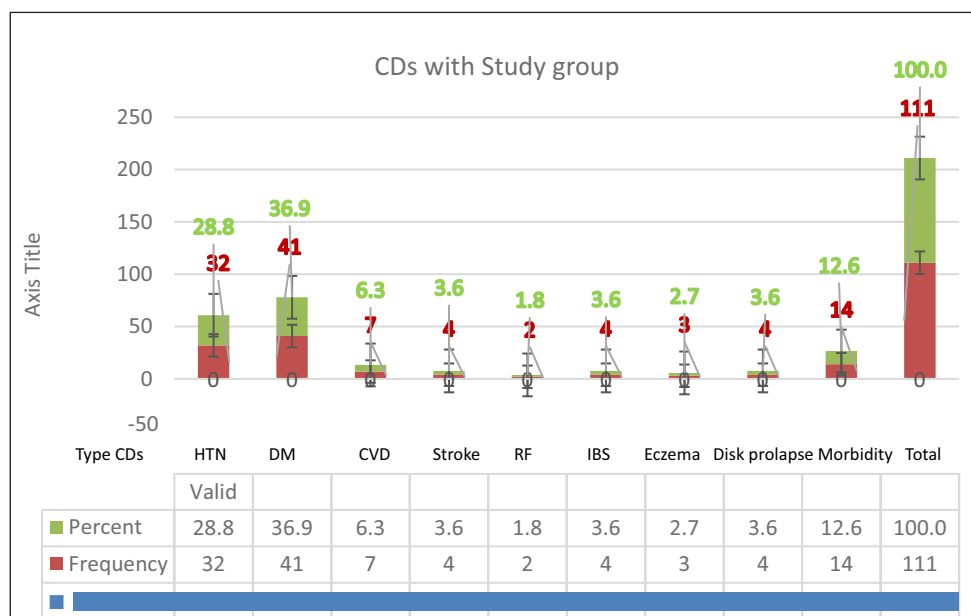
HTN: Hypertension, DM: Diabetes Mellitus, CVD: Cardiovascular Disease, RF: Respiratory Failure, IBS: Irritable Bowel Syndrome

Figure 1: Distribution of Chronic Diseases among Patients in the Study Groups

Figure 1 explains the distribution of chronic diseases among patients in the study groups. The data highlights the prevalence of various chronic conditions, such as Hypertension (HTN), Diabetes Mellitus (DM), Cardiovascular Disease (CVD), stroke, respiratory failure (RF), irritable bowel syndrome (IBS), eczema and disc prolapse. This distribution provides insight into the health challenges faced by the participants and underscores the importance of targeted health interventions.
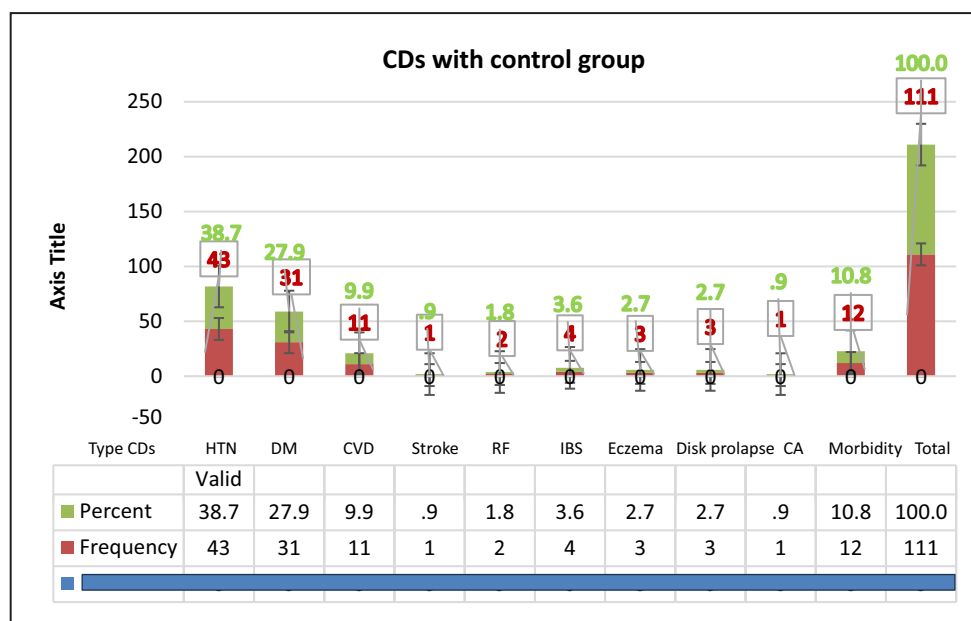
HTN: Hypertension, DM: Diabetes Mellitus, CVD: Cardiovascular Disease, RF: Respiratory Failure, IBS: Irritable Bowel Syndrome

Figure 2: Distribution of Chronic Diseases among Patients in the Control Groups

Figure 2 presents the distribution of chronic diseases among patients in the control groups. Similar to

Figure 1, this figure details the prevalence of various chronic conditions, allowing for a comparative analysis between the study and control groups. Understanding the distribution of these diseases is crucial for evaluating the effectiveness of the instructional program and identifying areas for improvement in health management strategies.

Table 2: The Influence of the Instructional Program on Health Behaviours of Patients in the Study and Control Groups

Instructional Program: Two groups							
Type test	Domains HL	Study Group (n=111)			Control Group (n=111)		
		*M Score	Paired *T*-Test		*M Score	Paired *T*-Test	
			*(r)	αSig		*(r)	αSig
Correlation Pretest- Post test 1	HR	3.57	0.992	0.01	1.90	0.027	0.6
	PA	3.03	0.6	0.00	2.04	-.078-	0. 4
	N	2.82	0.6	0.00	1.81	-0.003-	0.2
	SG	2.95	0.6	0.00	2.04	0.07	0.9
	IR	2.80	0.6	0.00	2.02	-0.007-	0.9
	SM	3.02	0.6	0.00	1.93	-0.145-	0.7
	Total	3.03	0.6	0.00	1.95	0.04	0.6
Correlation Pretest- Post test 2	HR	3.88	0.6	0.00	1.84	0.170	0.07
	PA	3.12	0.6	0.00	2.10	-0.18-	0.05
	N	2.94	0.6	0.00	1.85	-0.16-	0.9
	SG	3.00	0.6	0.00	1.96	0.06	0.5
	IR	3.06	0.6	0.00	2.09	-0.07-	0.4
	SM	2.96	0.6	0.00	1.84	-0.09-	0.02
	Total	3.16	0.6	0.00	1.94	0.1	0.3

Statistical Method by Paired sample T-Test (test-retest), M= Mean score; correlation coefficient- (r), HR-Health responsibility, PA-Physical activity, N-Nutrition, SG-Spiritual growth, IR-Interpersonal relations, SM-Stress Management; αSig=p values of SPSS output*

Table 2 illustrates the impact of the instructional program on health behaviours among patients in both the study and control groups. The paired *t*-test results show significant improvements in health-related behaviours in the study group compared to the control group, indicating the effectiveness of the instructional program in enhancing health behaviours.

Table 3: The Influence of Sociodemographic Variables on Health-Related Behaviours among Chronic Disease Patients for the Pretest of the Study Group

Characteristic	Score of Overall Health	HR	PA	N	SG	IR	SM	*P*-value
Age	2.74	-0.1	-0.01	-0.04	0.07	0.06	-0.12	<0.001**
Gender	1.70	0.02	-0.08	-0.08	0.08	-0.03	-0.07	<0.001**
Education	2.90	0.001	-0.12	-0.06	-0.04	-0.1	0.04	<0.001**
Marital Status	2.13	-0.14	-0.03	-0.08	0.05	-0.05	0.06	<0.001**
Occupation	2.15	-0.16	-0.08	-0.11	0.01	-0.02	-0.10	<0.001**
Work Hours	2.49	0.03	-0.10	-0.10	0.01	0.06	-0.05	<0.001**
Residence	1.60	-0.03	0.04	0.15	-0.14	0.02	-0.16	<0.001**
Monthly Income	2.31	-0.02	-0.07	-0.04	-0.17	-0.16	0.06	<0.001**
Chronic Diseases	2.72	0.12	-0.03	0.07	0.08	0.08	0.05	<0.001**
BMI	03.03	0.11	-0.16	0.03	-0.08	-0.10	-0.11	<0.001**
Smoking	1.77	0.07	-0.21	0.02	0.05	-0.01	-0.05	<0.001**
Physical Activity	2.53	0.05	-0.04	0.07	-0.018	-0.019	-0.07	<0.001**
Overall	2.33	-0.004	-0.07	-0.01	-0.008	-0.02	-0.03	<0.001**

**--highly significant

Table 3 displays the influence of various sociodemographic variables on health-related behaviours among chronic disease patients in the pretest phase of the study group. The scores indicate how different characteristics, such as age, gender, and education, correlate with health behaviours, highlighting the significant role these factors play in influencing overall health outcomes.

Table 4: The Influence of among Chronic Disease Patients for the Pretest of the Control Group

Characteristic	Score of Overall Health	HR	PA	N	SG	IR	SM
Age	2.82	0.9	-0.02	0.8	-0.10	0.2	-0.22
Gender	1.64	0.7	-0.02	0.4	-0.16	0.9	-0.03
Education	03.08	0.8	0.04	0.6	0.03	0.6	-0.06
Marital Status	2.21	0.7	-0.03	0.6	-0.08	0.3	0.02
Occupation	02.05	0.6	-0.06	0.4	-0.14	0.2	0.15
Work Hours	2.36	0.4	-0.009	0.8	-0.10	0.9	0.01
Residence	1.64	0.3	0.09	0.3	0.14	0.1	-0.03
Monthly Income	2.21	0.9	0.02	0.7	-0.02	0.9	-0.06
CDs	2.59	0.4	-0.1	0.9	0.07	0.9	0.22
BMI	03.08	0.2	0.15	0.1	-0.06	0.5	0.02
Smoking	1.77	0.7	-0.08	0.3	0.02	0.8	-0.09
Physical Activity	2.52	0.3	-0.08	0.7	0.04	0.6	0.10
Overall	2.33	0.5	0.002	0.5	0.04	0.5	0.001

Table 4 summarises the influence of sociodemographic variables on health-related behaviours among chronic disease patients in the control group during the pretest phase. The data reveals the baseline health behaviour scores across various characteristics. The scores indicate how different characteristics, such as age, gender, and education, correlate with health behaviours, highlighting the significant role these factors play in influencing overall health outcomes.

Table 5: The Influence of Sociodemographic Variables on Health-Related Behaviours among Chronic Disease Patients for the post-test 1 of the Study Group

Characteristic	Score of Overall Health	HR	PA	N	SG	IR	SM	P-value
Age	3.60	0.2	-0.02	0.7	-0.03	0.7	-0.18	<0.001**
Gender	2.57	0.3	0.05	0.9	0.07	0.4	-0.02	<0.001**
Education	3.77	0.8	0.04	0.6	0.03	0.6	-0.06	<0.001**
Marital Status	2.99	0.7	-0.03	0.6	-0.08	0.3	0.02	<0.001**
Occupation	03.01	0.8	-0.01	0.8	0.02	0.8	-0.21	<0.001**
Work Hours	3.35	0.4	-0.009	0.8	-0.10	0.9	0.01	<0.001**
Residence	2.47	0.3	0.09	0.3	0.14	0.1	-0.03	<0.001**
Monthly Income	3.18	0.9	0.02	0.7	-0.02	0.9	-0.06	<0.001**
CDs	3.58	0.4	-0.1	0.9	0.07	0.9	0.22	<0.001**
BMI	3.89	0.2	0.15	0.1	-0.06	0.5	0.02	<0.001**
Smoking	2.67	0.7	-0.08	0.3	0.02	0.8	-0.09	<0.001**
Physical Activity	3.15	0.3	-0.08	0.7	0.04	0.6	0.10	<0.001**
Overall	3.18	0.5	0.002	0.6	0.01	0.4	0.002	<0.001**

**--highly significant

Table 5 presents the influence of sociodemographic variables on health-related behaviours among chronic disease patients in the study group after the first post-test. The results indicate improvements in overall health scores, suggesting that the instructional program effectively enhanced health behaviours across various demographic factors.

Table 6: The Influence of Sociodemographic Variables on Health-Related Behaviours among Chronic Disease Patients for the post-test 1 of the Control Group

Characteristic	Score of Overall Health	HR	PA	N	SG	IR	SM
Age	3.60	0.2	-0.02	0.7	-0.03	0.7	-0.18
Gender	2.57	0.3	0.05	0.9	0.07	0.4	-0.02
Education	3.77	0.8	0.04	0.6	0.03	0.6	-0.06
Marital Status	2.99	0.7	-0.03	0.6	-0.08	0.3	0.02
Occupation	03.01	0.8	-0.01	0.8	0.02	0.8	-0.21
Work Hours	3.35	0.4	-0.009	0.8	-0.10	0.9	0.01
Residence	2.47	0.3	0.09	0.3	0.14	0.1	-0.03
Monthly Income	3.18	0.9	0.02	0.7	-0.02	0.9	-0.06
CDs	3.58	0.4	-0.1	0.9	0.07	0.9	0.22
BMI	3.89	0.2	0.15	0.1	-0.06	0.5	0.02
Smoking	2.67	0.7	-0.08	0.3	0.02	0.8	-0.09
Physical Activity	3.15	0.3	-0.08	0.7	0.04	0.6	0.10
Overall	3.18	0.5	0.002	0.6	0.01	0.4	0.002

Table 6 outlines the influence of sociodemographic variables on health-related behaviours among chronic disease patients in the control group after the first posttest. The results indicate that, despite some improvements, the control group did not experience significant changes in health behaviours, emphasising the need for structured interventions.

Table 7: The Influence of Sociodemographic Variables on Health-Related Behaviours among Chronic Disease Patients for the Post-test 2 of the Study Group

Characteristic	Score of Overall Health	HR	PA	N	SG	IR	SM	*P*-value
Age	3.60	0.2	-0.02	0.7	-0.03	0.7	-0.18	<0.001**
Gender	2.57	0.3	0.05	0.9	0.07	0.4	-0.02	<0.001**
Education	3.77	0.8	0.04	0.6	0.03	0.6	-0.06	<0.001**
Marital Status	2.99	0.7	-0.03	0.6	-0.08	0.3	0.02	<0.001**
Occupation	03.01	0.8	-0.01	0.8	0.02	0.8	-0.21	<0.001**
Work Hours	3.35	0.4	-0.009	0.8	-0.10	0.9	0.01	<0.001**
Residence	2.47	0.3	0.09	0.3	0.14	0.1	-0.03	<0.001**
Monthly Income	3.18	0.9	0.02	0.7	-0.02	0.9	-0.06	<0.001**
CDs	3.58	0.4	-0.1	0.9	0.07	0.9	0.22	<0.001**
BMI	3.89	0.2	0.15	0.1	-0.06	0.5	0.02	<0.001**
Smoking	2.67	0.7	-0.08	0.3	0.02	0.8	-0.09	<0.001**
Physical Activity	3.15	0.3	-0.08	0.7	0.04	0.6	0.10	<0.001**
Overall	3.18	0.5	0.002	0.6	0.01	0.4	0.002	<0.001**

**--*highly significant*

Table 7 shows the influence of sociodemographic variables on health-related behaviours among chronic disease patients in the study group after the second post-test. The results indicate sustained improvements in health behaviours, reinforcing the effectiveness of the instructional program over time.

Table 8: The Influence of Sociodemographic Variables on Health-Related Behaviours among Chronic Disease Patients for the Post-test 2 of the Control Group

Characteristic	Score of Overall Health	HR	PA	N	SG	IR	SM
Age	2.74	-0.05	0.08	0.03	-0.14	0.1	0.15
Gender	1.55	-0.10	0.07	0.04	-0.07	0.2	0.09
Education	3.00	-0.08	0.05	-0.01	0.12	-0.2	0.05
Marital Status	2.12	0.04	0.07	0.04	-0.04	0.6	0.11
Occupation	1.96	0.12	0.02	-0.07	0.01	0.8	0.29
Work Per week	2.28	0.01	-0.02	-0.01	-0.19	-0.08	-0.29
Place residence	1.55	-0.15	-0.02	0.06	-0.09	0.3	0.08
Income monthly	2.12	0.10	0.17	-0.03	0.14	0.8	0.14
CDs	2.50	-0.15	0.05	0.6	-0.01	0.9	0.03
BMI	3.11	0.05	0.15	-0.01	0.02	0.7	0.03
Smoking	1.67	0.10	-0.09	0.3	0.12	-0.5	0.13
Physical Activity	2.49	0.16	-0.13	-0.1	0.05	-0.7	-0.13
Overall	2.25	0.03	0.01	0.04	0.01	0.4	0.009

Table 8 summarises the influence of sociodemographic variables on health-related behaviours among chronic disease patients in the control group after the second post-test. The results indicate minimal changes in health behaviours, highlighting the necessity for structured educational interventions to promote healthier lifestyles.

DISCUSSION

Socioeconomic factors, particularly education and income, significantly influence health behaviours, and the instructional program positively impacted older individuals and those with lower education levels. As shown in Table 1, age, gender, and education are critical determinants of health behaviours in chronic disease patients (Mousa & Mansour, 2020). Chronic conditions, such as diabetes and hypertension, are prevalent and closely linked to health behaviours (WHO, 2013; Hwang & Oh, 2020). This study supports the notion that structured instructional programs can effectively improve health behaviours in chronic disease management (Allar, Eruchalu & Ortega, 2023).

The findings indicate that socioeconomic status plays a crucial role in shaping health behaviours, with

higher education and income associated with better health outcomes (Holt-Lunstad *et al*., 2022). Health interventions, as highlighted in this study, can enhance physical activity levels and reduce body mass index (BMI) among patients (NIH & Karen, 2024; Alhamad & Hassan, 2023). However, socioeconomic factors can also hinder healthy behaviours, particularly for lower-income individuals (Liu *et al*., 2023). The association of older age and lower education with poorer health outcomes is consistent with previous research (Alageel *et al*., 2023; Zhu *et al*., 2023).

Figures 1 and 2 illustrate that diabetes and hypertension are common chronic conditions that often co-occur (Barnett *et al*., 2025; Anderson & Durstine, 2019; Raghoebar *et al*., 2024). Health education programs have the potential to motivate individuals to quit smoking, which is a significant risk factor for these conditions (Nunes, Limpo & Castro, 2018; Graf *et al*., 2023). In comparison with Table 3, previous studies have shown that structured instructional programs effectively reduce BMI in individuals with chronic diseases (Balaj *et al*., 2024; Hacker, 2024).

As indicated in Table 3, health education enhances lifestyle habits (Mousa & Mansour, 2020; WHO, 2013), while a lack of support can hinder progress. Tailored interventions are essential for promoting positive changes in health behaviours (Ghasemian *et al.*, 2024), as sociodemographic factors significantly influence behaviour (Coleman, Ferguson & Nash, 2024). Table 4 reveals similar trends, emphasizing the necessity for targeted interventions to address gaps in health behaviours (Heriseanu *et al*., 2023; Sheer & Lo, 2023).

The post test results presented in Table 5 indicate that higher education levels correlate with improved health outcomes (Sadiq, 2023). Conversely, Table 6 shows that the absence of intervention in the control group led to minimal changes in health behaviours (Samuel *et al*., 2020). In contrast, the results in Table 7 demonstrate that ongoing health education interventions can sustain improvements in health behaviours (Kim *et al.*, 2018).

Finally, Table 8 highlights that the control group exhibited no significant change in health behaviours, underscoring the importance of educational programs (El-Said *et al*., 2022). In contrast, structured instructional programs significantly enhance health behaviours, aligning with the broader literature advocating for health education in chronic disease management (Rana *et al*., 2024; Uemura, Yamada & Okamoto, 2021; Hassan & Mansur, 2020; Najee & Shaker, 2019; Alwardi & Khuder, 2022). These findings collectively emphasise the critical role of tailored health education programs in improving health outcomes for patients with chronic diseases.

Limitation

This study has limitations that should be acknowledged. First, the sample was drawn from a specific geographic area (Diwaniyah City, Iraq), which may limit the generalisability of the findings to other regions or populations. Second, the reliance on self-reported data may introduce bias, as participants might have provided socially desirable responses rather than accurate reflections of their health behaviours. Additionally, the study's short follow-up period may not adequately capture the long-term effects of the instructional program on health-related behaviours. Future research should consider a longitudinal design with a more diverse sample to enhance the validity and applicability of the findings.

CONCLUSION

Sociodemographic factors significantly influence health behaviours in chronic disease patients. Higher education levels correlate with better health behaviours, and educational programs can improve these behaviours. Therefore, nurses should tailor health education to different demographics, provide continuous support, and engage communities. Policymakers should prioritise health education, reduce disparities, and integrate lifestyle counselling into healthcare. This includes increasing awareness, developing culturally relevant materials, and collaborating for effective strategies.

Future scope should explore the integration of technology in health education programs, such as mobile health applications, to facilitate ongoing support for patients with chronic diseases. Additionally, studies could investigate the effectiveness of tailored interventions that address specific sociodemographic factors influencing health behaviours.

This study highlights the significant impact of sociodemographic factors on health behaviours among

patients with chronic diseases. The findings underscore the necessity for targeted health promotion programs that consider these variables to improve health outcomes. Nurses and healthcare providers should prioritise culturally relevant education and continuous support to foster healthier lifestyles among patients.

Recommendation

Based on the study findings, it is recommended to develop tailored health education programs that address the specific needs of diverse demographic groups, including considerations of age, gender, education, and socioeconomic status. Additionally, healthcare providers should engage with communities through workshops and outreach initiatives focused on chronic disease management. The integration of technology, such as mobile health applications and telehealth services, can enhance ongoing support for patients. Policymakers are encouraged to advocate for health education and lifestyle counselling, particularly for underserved populations, while establishing systems for continuous support and follow-up after educational interventions. Finally, further research should be conducted to assess the long-term effects of health education programs and the role of technology in enhancing these interventions.

Conflict of Interest

The authors declare that they have no competing interests.

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REFERENCES

Alwardi, H. F. A., & Khuder, K. M. (2022). Effectiveness of an Instructional programme on patients' knowledge about exercises to prevent coronary artery disease progression after percutaneous coronary intervention (PCI). *Mosul Journal of Nursing, 10*(3), 199-205. https://doi.org/10.53350/pjmhs22165753

Ahmed, M. M., Naji, A. B., & Younis, N. M. (2023). Efficacy of an educational programme based on health belief model to enhancing weight control behaviours among employees in the University of Mosul: A randomized controlled trial. *Revis Bionatura, 8*(3), 1-10. https://doi.org/10.21931/RB/2023.08.03.28

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes, 50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Al Omari, O., Alshammari, M., Al Jabri, W., Yahyaei, A. A., Aljohani, K. A., Sanad, H. M., ... & Aljezawi, M. (2024). Demographic factors, knowledge, attitude and perception and their association with nursing students' intention to use artificial intelligence (AI): a multicentre survey across 10 Arab countries. *BMC Medical Education, 24(1)*. https://doi.org/10.1186/s12909-024-06452-5

Alageel, S., Alhujaili, M., Altwaijri, Y., Bilal, L., & Alsukait, R. (2023). Barriers and facilitators to adopting healthier lifestyle among low-income women in Saudi Arabia: a qualitative study. *Health Expectations, 26*(3), 1202-1212. https://doi.org/10.1111/hex.13735

Al-Ganmi, A. H. A., Perry, L., Gholizadeh, L., & Alotaibi, A. M. (2018). Behaviour change interventions to improve medication adherence in patients with cardiac disease: protocol for a mixed methods study including a pilot randomised controlled trial. *Collegian, 25*(4), 385-394. https://doi.org/10.1016/j.colegn.2017.10.003

Alhamad, H., & Hassan, H. (2023). Effectiveness of instructional programme on patients' nutritional habits for patients with peptic ulcer. *Iraqi National Journal of Nursing Specialties, 1*(36), 35-48. https://doi.org/10.58897/injns.v36i1.637

Ali, H., & Qassim, W. J. (2023). Assessment of old age behaviours toward cardiovascular health promotion. *Iraqi National Journal of Nursing Specialties, 36*(1), 26-34. https://doi.org/10.58897/injns.v36i1.709

Alkasab, H. E. & Aziz, A.R. (2023). Effectiveness of instruction programme on adolescent girls' dietary habits diagnosed with iron deficiency anemia. *Iraqi National Journal of Nursing Specialties, 36*(1). https://doi.org/10.58897/injns.v36i1.682

Allar, B. G., Eruchalu, C. N., & Ortega, G. (2023). Factors in surgical public health and health disparities research. In *Translational Surgery* (pp. 615-622). Academic Press, US. https://doi.org/10.1016/B978-0-323-90300-4.00021-5

Al-Mayahi, A. M. M., Al-Jubouri, M. B., & Jaafar, S. A. (2023). Healthy lifestyle behaviours and risk of cardiovascular diseases among nursing faculty during COVID-19 Pandemic. *Revista Brasileira de Enfermagem, 76.* https://doi.org/10.1590/0034-7167-2022-0372

Anderson, E., & Durstine, J. L. (2019). Physical activity, exercise and chronic diseases: a brief review. *Sports Medicine and Health Science, 1*(1), 3-10. https://doi.org/10.1016/j.smhs.2019.08.006

Athbi, H. A., & Hassan, H. B. (2019). Health beliefs of patients with coronary heart disease toward secondary prevention: the health beliefs model as a theoretical framework. *Indian Journal of Public Health Research & Development, 1*(1), 821-826. https://doi.org/10.5958/0976-5506.2019.00161.X

Balaj, M., Henson, C. A., Aronsson, A., Aravkin, A., Beck, K., Degail, C., ... & Gakidou, E. (2024). Effects of education on adult mortality: a global systematic review and meta-analysis. *The Lancet Public Health, 9*(3), e155-e165. Retrieved from: https://www.thelancet.com/journals/lanpub/article/piis2468-2667(23)00306-7/fulltext. Accessed on 7th January 2024.

Barnett, A., Mayr, H. L., Keating, S. E., Conley, M. M., Webb, L., Jegatheesan, D. K., ... & Hickman, I. J. (2025). Use of digital food records in clinical settings: Lessons in translation from a randomised controlled trial. *Journal of Human Nutrition and Dietetics, 38*(1). https://doi.org/10.1111/jhn.13389

Benjamin, E. J., Muntner, P., Alonso, A., Bittencourt, M. S., Callaway, C. W., Carson, A. P., ... & American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee (2019). Heart disease and stroke statistics—2019 update: a report from the American Heart Association. *Circulation, 139*(10), e56-e528. https://doi.org/10.1161/CIR.0000000000000659

Centers for Disease Control and Prevention (CDC). (2019). Physical activity basics. Retrieved from: https://www.cdc.gov/physical-activity-basics/about/index.html. Accessed on 9th May,2024.

Coleman, C., Ferguson, S. G., & Nash, R. (2024). Barriers to smoking interventions in community healthcare settings: A scoping review. *Health Promotion International, 39*(2). https://doi.org/10.1093/heapro/daae036

El-Said, A., Patil, R., Leone, B., Gulani, A., Abrams, M. P., Momin, A., ... & Abrams, M. (2022). Assessing the impact of demographic factors on presenting conditions or complaints among internal medicine patients in an underserved population in Central Florida. *Cureus, 14(*8). https://doi.org/10.7759/cureus.27811

Garvey, W. T. (2023). The fundamental role of obesity management in cardiometabolic risk reduction: nonpharmacological, pharmacological, and surgical approaches. In *Cardiovascular Endocrinology and Metabolism* (pp. 273-309). Academic Press, US. https://doi.org/10.1016/B978-0-323-99991-5.00018-8

Ghasemian, A., Sargeran, K., Khami, M. R., & Shamshiri, A. R. (2024). Effects of educational interventions based on the theory of planned behaviour on oral cancer-related knowledge and tobacco smoking in adults: a cluster randomized controlled trial. *BMC Cancer, 24*(1), 45. https://doi.org/10.1186/s12885-024-11845-2

Graf, J., Simoes, E., Kranz, A., Weinert, K., & Abele, H. (2023). The importance of gender-sensitive health care in the context of pain, emergency and vaccination: a narrative review. *International Journal of Environmental*

Research and Public Health, 21(1), 13. https://doi.org/10.3390/ijerph21010013.

Hacker, K. (2024). The burden of chronic disease. *Mayo Clinic Proceedings: Innovations, Quality & Outcomes, 8*(1), 112-119. https://doi.org/10.1016/j.mayocpiqo.2023.08.005

Hassan, S. F., & Mansur, K. A. (2020). Effectiveness of an instructional programme on promoting lifestyle of patients with diabetes mellitus type 2 at Diabetes and Endocrinology Center in Missan City. *Executive Editor, 11*(02). Retrieved from: https://openurl.ebsco.com/EPDB%3Agcd%3A2%3A1445682/detailv2?sid=ebsco%3Aplink%3Ascholar&id=ebsco%3Agcd%3A146454033&crl=f&link_origin=www .google.com. Accessed on 7ᵗʰ May, 2024.

Heriseanu, A. I., Karin, E., Walker, J., Scott, A. J., Bisby, M. A., Gandy, M., ... & Dear, B. F. (2023). The impact of obesity and overweight on response to internet-delivered cognitive behavioural therapy for adults with chronic health conditions. *International Journal of Obesity, 47*(6), 487-495. https://doi.org/10.1038/s41366-023-01285-6

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspectives on Psychological science, 10*(2), 227-237. https://doi.org/10.1177/1745691614568352

Hussain, E., & Mohammed, Z. (2021). Parents' attitudes toward immunization and its relation with pediatric immunization compliance at primary health care centers in Karbala City, Iraq. *Iraqi National Journal of Nursing Specialties, 34*(1), 50-58. https://doi.org/10.58897/injns.v34i1.460

Hwang, Y., & Oh, J. (2020). Factors affecting health-promoting behaviours among nursing students. *International Journal of Environmental Research and Public Health, 17*(17). https://doi.org/10.3390/ijerph17176291

Kardan, M., Jung, A., Iqbal, M., Keshtkar, S., Geidl, W., & Pfeifer, K. (2024). Efficacy of digital interventions on physical activity promotion in individuals with noncommunicable diseases: an overview of systematic reviews. *BMC Digital Health, 2*(1). https://doi.org/10.1186/s44247-024-00097-6

Khemka, S., Reddy, A., Garcia, R. I., Jacobs, M., Reddy, R. P., Roghani, A. K., ... & Reddy, P. H. (2023). Role of diet and exercise in aging, Alzheimer's disease, and other chronic diseases. *Ageing Research Reviews, 91*. https://doi.org/10.1016/j.arr.2023.102091

Khleel, H., & Mohammed, W. (2021). Evaluation of pregnancy-related health behaviours' change during pregnancy for pregnant women attending Abo Ghareeb primary health care sector. *Iraqi National Journal of Nursing Specialties, 34*(1), 59-68. https://doi.org/10.58897/injns.v34i1.461

Kim, S. H., Lee, S. Y., Kim, C. W., Suh, Y. J., Hong, S., Ahn, S. H., ... & KNDP Study Group. (2018). Impact of socioeconomic status on health behaviours, metabolic control and chronic complications in type 2 diabetes mellitus. *Diabetes & Metabolism Journal, 42*(5). https://doi.org/10.4093/dmj.2017.0102

Liu, L., Wu, X., Li, H. F., Zhao, Y., Li, G. H., Cui, W. L., ... & Cai, L. (2023). Trends in the prevalence of chronic non-communicable diseases and multimorbidity across socioeconomic gradients in Rural Southwest China. *The Journal of Nutrition, Health and Aging, 27*(6), 457-462. https://doi.org/10.1007/s12603-023-1932-y.

Maccido, H. M. (2024). The role of health education in preventing chronic diseases: Strategies, outcomes and future directions. *African Journal of Sports and Physical Sciences, 2*(1). https://doi.org/10.62154/ajsps.2024.02.010384

McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programmes. *Health Education Quarterly, 15*(4), 351-377. https://doi.org/10.1177/109019818801500401

Mousa A. M., & Mansour K. (2020). Effectiveness of an instructional programme concerning healthy lifestyle on patients' attitudes after percutaneous coronary intervention at Cardiac Centers in Baghdad City. *Iraqi National Journal of Nursing Specialties, 33*(1), 1-11. https://doi.org/10.58897/injns.v33i1.396

Najee, A. F., & Hassan, H. S. (2019). Effectiveness of an instructional programme on knowledge of type 2 diabetic

patient toward ocular self-care at diabetic and endocrine center in Al-Nasiriya City. *Indian Journal of Forensic Medicine & Toxicology, 13*(4), 929-933. https://doi.org/10.5958/0973-9130.2019.00417.1

Nunes, A., Limpo, T., & Castro, S. L. (2018). Effects of age, gender and personality on individuals' behavioural intention to use health applications. In *Proceedings of the 4th international conference on information and communication technologies for ageing well and e-health*. Retrieved from: https://repositorio-aberto.up.pt/bitstream/10216/116191/2/293043.pdf. Accessed on 9th January, 2024.

Oster, H., & Chaves, I. (2023). Effects of healthy lifestyles on chronic diseases: Diet, sleep and exercise. Nutrients, 15(21). https://doi.org/10.3390/nu15214627

Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2015). *Health promotion in nursing practice* (7th ed.). Pearson Education Inc. Retrieved from: https://www.scirp.org/reference/referencespapers?referenceid=3140765 , Accessed on 18th May, 2024.

Raghoebar, S., Mesch, A., Gulikers, J., Winkens, L. H., Wesselink, R., & Haveman-Nies, A. (2024). Experts' perceptions on motivators and barriers of healthy and sustainable dietary behaviours among adolescents: The SWITCH project. *Appetite, 194*. https://doi.org/10.1016/j.appet.2023.107196.

Rana, M. S., Alam, M. B., Khanam, S. J., Kabir, M. I., Khandaker, G., & Khan, M. N. (2024). Prevalence and patterns of comorbidities in people with disabilities and their associated socio-demographic factors. *Scientific Reports, 14*(1). https://doi.org/10.1038/s41598-024-51678-4

Sadiq, I. (2023). Lifestyle medicine as a modality for prevention and management of chronic diseases. *Journal of Taibah University Medical Sciences, 18*(5), 1115–1117. https://doi.org/10.1016/j.jtumed.2023.04.001

Sallis, J. F., Owen, N., & Fisher, E. (2015). Ecological models of health behaviour. *Health Behaviour: Theory, Research, and Practice, 5*(43-64). Retrieved from: https://shorturl.at/bVaKe. Accessed on 18th May, 2024.

Samuel, B., Adedamola, A., Oladayo, A., & Temitope, I. (2020). Role of exercise and physical activity in prevention and management of chronic diseases. *Cardiovascular Diseases, 11*. https://doi.org/10.30574/gscbps.2020.12.3.0277

Sheer, A. J., & Lo, M. C. (2023). Counseling Patients with Obesity. In StatPearls. StatPearls Publishing, USA. Retrieved from: https://europepmc.org/article/nbk/nbk589679. Accessed on 7th January, 2024.

Shinjar, F. J., Bakey, S. J., & Khudur, K. M. (2018). Effectiveness of an education programme on hemodialysis patients, knowledge towards dietary regimen at Al-Hussein teaching hospital in Al-Nasiriyha city. *Indian Journal of Public Health Research & Development, 9*(10), 622-627. https://doi.org/10.5958/0976-5506.2018.01202.0

Su, B., Li, D., Xie, J., Wang, Y., Wu, X., Li, J., ... & Zheng, X. (2023). Chronic disease in China: geographic and socioeconomic determinants among persons aged 60 and older. *Journal of the American Medical Directors Association, 24*(2), 206-212. https://doi.org/10.1016/j.jamda.2022.10.002.

Uemura, K., Yamada, M., & Okamoto, H. (2021). The effectiveness of an active learning programme in promoting a healthy lifestyle among older adults with low health literacy: A randomized controlled trial. *Gerontology, 67*(1), 25-35. https://doi.org/10.1159/000511357.

World Health Organization(2013). Global action plan for the prevention and control of noncommunicable diseases 2013-2020. In Global action plan for the prevention and control of noncommunicable diseases 2013-2020. Retrieved from: https://www.who.int/publications/i/item/9789241506236. Accessed on 9th April 2024.

Zhu, X., Zhang, F., Luo, Z., Liu, H., Lai, X., Hu, X., ... & Long, Y. (2023). Effect of the number of unhealthy lifestyles in middle-aged and elderly people on hypertension and the first occurrence of ischemic stroke after the disease. *Frontiers in Cardiovascular Medicine, 10*. https://doi.org/10.3389/fcvm.2023.1152423.