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The Relationship between Health literacy and Health-Related Behaviors among Clients with Chronic Diseases

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Abstract: Background: Health literacy is an emerging concept in the health care environment. It is one of the main factors that is related to adoption of the healthy related behaviors. Clients with low health literacy are frequently facing difficulties specially, when having chronic diseases. **Purpose**: Determine the relationship between health literacy and health related behaviors among clients with chronic diseases. **Design**: Descriptive correlational design. **Setting**: Outpatient clinics of three governmental hospitals in Menofia governorate, Egypt. **Sample**: A purposive sample of 241 clients with chronic diseases. **Instruments**: Three instruments were used: 1) A structured interview questionnaire, it includes socio-demographic characteristics, medical history and sources of health information of the participants. 2) Health literacy scale. 3) Reported health related- behaviors scale. **Results**: The study findings revealed that mean age of the studied sample 43.54 ± 10.57. About 48% of them ha\ good health literacy and about 61% of them had moderate level of reported health- related behaviors. In addition, there was a statistically significant positive correlation between health literacy and reported health-related behaviors. Also, there was a statistically significant positive correlation between total mean score of participant health literacy level and total mean score of subscales of reported health-related behaviors. **Conclusion**: There was a statistically significant positive correlation between health literacy and reported health-related behaviors. Also, there were a positive relationship between occupation, level of education and total mean score of health literacy and health-related behaviors. **Recommendations**: Programs should be designed and implemented to improve health literacy and health- related behaviors of clients with chronic condition in different health care setting.

Keywords*: Chronic diseases, Health literacy, Reported health behavior.*

Introduction

Health literacy (HL) is an important determinant of public as well as individual health, and seen as a core element of client centered care (Sørensen et al., 2021). In recent years, there is a growing effort to identify and respond to the health care needs of populations that expected to improve health care quality and equality; and mutual transitions in health care governance and financing as well as service planning and delivery (Altin & Stock, 2015); it's also expected to enhance access to health care services for vulnerable populations (Bhatt & Bathija, 2018).

HL is also, considered as a major public health goal that can be used as an independent influencing factor of health outcomes. In addition, people with insufficient health literacy may have higher medical expenditures and cause substantial financial burden (Rasu et al., 2015; Bhusal et al., 2021). Consequently, health literacy has become an important indicator for the measurement of health status among residents. Improving health literacy is a fundamental, economical, and practical measure to enhance the health of people in general (Huang et al., 2021).

HL indicates the ability to read and write and encompasses a wider array of competencies to manage one's health, seek consultation, engage and communicate with healthcare providers and navigate through complex healthcare systems (Rheault et al., 2019). Health literacy also encompasses the critical appraisal of health information from different sources; get needed social support to access health services and understand ones' rights as healthcare consumers (Maindal et al., 2016; Brach, 2017; Liu et al., 2020).

Human behaviors had main role within the maintenance of health and the prevention of diseases. Health-risk behaviors are activities done by people with intensity or frequency that increases the risk of disease or injury. Health-risk behaviors can be clusters together to constitute risky lifestyle. Behavioral patterns of individuals toward their environment may cause much morbidity and mortality; that may cause negative influences on their performance and total quality of life (Hawkins & Anderson, 2014; Awad et al., 2018). On the other hand, people with sufficient health literacy tend to have health lifestyle, less likely to smoke, exercise more frequently, self-rate their health status as better, and having increased concern about national as well as global health status of society (Awad et al., 2018; Huang et al., 2021).

Non communicable diseases (NCD) are group of conditions that are not mainly caused by an acute infection (Pan American Health Organization [PAHO]/ World Health Organization [WHO], 2021), and considered as the leading cause of global mortality. These diseases including cancers, cardiovascular disease, diabetes, hypertension, obesity and atherosclerosis. Many of NCD can be prevented by reducing common risk factors that may includes tobacco use, harmful alcohol use, physical inactivity and eating unhealthy diets

(Budreviciute et al., 2020); which intern increase the chances to develop non-communicable diseases. The risk factors can be classified into modifiable or non-modifiable risk factors (Gbadamosi &Tlou, 2020). The modifiable risk factors involve high blood pressure, smoking, diabetes mellitus, physical inactivity, obesity, and high blood cholesterol; while the non-modifiable risk factors involve age, gender, genetic factors, race, and ethnicity (Budreviciute et al., 2020).

Nurses play a significant role in clients' health literacy especially those with chronic diseases; because clients with chronic diseases require sustained treatment and self-care over extended periods, to successfully manage chronic diseases, clients must be aware about their illnesses and practice disease self-management; nurses as educator can help to enhance the self-efficacy, coping, and self-management skills of clients, to promote and maintain their physical and psychological well-being; and have a good quality of life despite their chronic conditions (Chan, 2021).

Significance of the study

Health literacy is a major public health goal and essential to reduce medical expenditures, social as well as financial burden. Health literacy is lacking worldwide to constitute approximately 39% among people (Bhusal et al., 2021; Huang et al., 2021).

Non-communicable diseases, including heart disease, stroke, cancer, diabetes and chronic lung disease, are collectively responsible for almost 70% of all deaths worldwide. About three quarters of all NCD deaths, and 82% of the 16 million people who died prematurely, or before reaching 70 years of age, occur in low- and middle-income countries. In Egypt, mortality rate from 30 to 70 years is occurring at 25%, it is estimated that mortality from chronic diseases account 85% of all deaths; cardiovascular diseases accounted 46% from all diseases, cancer (14%), chronic respiratory diseases (4%) and diabetes (1%) (Egypt Multisectoral Action Plan for Prevention and Control of Non-Communicable Diseases 'MAP-NCD', 2017).

Unhealthy related behavior is the primary major risk factors of non-communicable diseases are: tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets; that can be prevented by increasing client health literacy (WHO, 2022). People with lower health literacy have less knowledge of their health problems, less knowledgeable on how to effectively self- manage, have lower uptake of health screenings, lower rates of engagement in health promoting behaviors', lower medication adherence, higher rates of hospitalization, experience 30-day hospital readmission after discharge, and have a poorer overall health status (Rheault et al., 2019). Therefore, this study conducted to determine the relationship between health literacy and health related behaviors among clients with chronic diseases.

Purpose of the study

To determine the relationship between health literacy and health-related behaviors among clients with chronic diseases.

Research Questions

1) What is the health literacy level among clients with chronic diseases?
2) What is the reported health-related behavior level among clients with chronic diseases?
3) Is there a relation between health literacy and reported health- related behaviors among clients with chronic diseases?
4) Is there a relation between demographic variable, health literacy and health-related behavior?

Methods

Research design:

Descriptive correlational design was used to achieve the aim of this study.

Study settings:

This study was conducted in outpatient clinics of governmental hospitals in Menoufia governorate, Egypt. A multistage random technique was used to select the setting according to the following:

The first stage was random selection of three district from ten districts in Menofia. The selected districts were Shebin El-kom, Quesna, and Berkat El-saba. Then, one governmental hospital was selected from each district hospitals. These hospitals were Shebin El-kom teaching hospital, Quesna central hospital, and Berkat El-saba central hospital.

Study sample:

A purposive sample of 241 clients with chronic diseases attending the previously mentioned settings.in which 142 clients was taken from Shebin El-kom teaching hospital, 54 clients from Quesna central hospital and 45 clients from Berkat El-saba central hospital according to flow rate.

Sample size and power of the study:

In order to calculate the sample size required to determine the relationship between health literacy and health related behavior among clients with chronic diseases, Epi website was used (Open-Source Statistics for Public Health) *.

The assumptions are:

- Population size N=10000
- Frequency of chronic diseases in the population p = 20%+/-5%
- A power (1- β) or (% chance of detecting) of 80%.
- Confidence limits = 5%
- Design effect = 1
- Cluster =1
- The assumption was used in following equation.

Sample size *n* = [DEFF*Np (1-p)]/ [(d^2/Z$^2_{1-\alpha/2}$*(N-1) +p*(1-p)], where:

DEFF = Design effect =1

N = population size =10000

P=Frequency of chronic diseases in the population = 20 %

D= Confidence limits as % of 100(absolute +/- %) = 5%

Z= 1.96

Confidence level = 95%

Based on the previous equation sample size was 241clients with chronic diseases used to collect the data of this study.

Inclusion criteria:

- The client with one or more chronic diseases including cardiovascular diseases, hypertension,

type2diabetes, obesity and atherosclerosis.
- Client aged between 30-60 years old.

Data Collection Instruments:

Three instruments were used to collect data about this study which are:

Instrument one: A structured interview questionnaire,

it was constructed and utilized by the researcher to elicit information about demographic characteristics of the study participants such as age, sex, occupation, educational level, income, residence and marital status, as well as, it includes 5 questions about medical history of the study participants including current medical history, family history, types of chronic diseases, onset of each disease, and types of services that diagnoses the disease and also include four questions about sources of health information of the study participants.

Instrument two: Health Literacy scale

Health Literacy scale was used to assess participants health literacy level about chronic diseases. The scale was adopted from (The HLS-EU Consortium, 2012), and it consisted of 16 questions. The scale is measured with likert scale of 3 responses.

Scoring system of health literacy scale

The responses of the scale were scored as difficult =0, somewhat difficult =1 and easy=2. The total score of the scale ranged from 0 to 32. The higher score indicates better level of health literacy and the lower score indicates poor level of health literacy. The total score was categorized into poor health literacy when total score ≤50%, fair health literacy when total score 51-75% and good health literacy when total score ≥76%.

Instrument three: Reported Health related behaviors scale

Health related behaviors scale was adopted from Woynarowska-Sołdan et al., (2018) and utilized to assess health related behaviors of the participants. The scale consists 27 statements describing certain health behaviors in four subscales; nutrition, physical activity and sports practice, relaxation and behaviors related to mental health, and preventive behaviors. The response for the statements of the scale was in likert scale (3 responses) from 0 to 2

Scoring system of reported health-related behavior scale

The responses of the scale were scored as never =0, sometimes =1 and always=2. The total score of the scale ranged from 0 to 54. The total score was categorized into low health-related behavior when total score ≤50%, moderate health-related behavior when total score 51-75% and high health-related behavior when total score ≥76%.

Validity of the instrument

The data collection instruments were developed by the researchers in English language and translated to Arabic language. The Arabic version of the questionnaire was reviewed by Arabic / English speaker specialist and

the suggested modifications were carried out. After revision for translation, the data collection instrument was revised for content validity by a jury of five experts in family and community health nursing and medical- surgical nursing and their recommended modifications were carried out accordingly.

Reliability of the instruments:

Data collection instruments was tested for its reliability using Cronbach's alpha test. It was 0.844 for second instrument (health literacy scale) and 0.909 for third instrument (reported health-related behaviors scale); which indicate that the instruments were reliable for data collection.

Pilot study

Before starting the actual data collection, a pilot study was carried out on 10% of the study sample (24) that has the same criteria of the study sample to assess clarity, feasibility and applicability of the instruments. The pilot study was also used to estimate the needed time for each subject to fulfill each data collection instrument. The time estimated for each subject was 20 minutes. The needed modifications were done based on the results of the pilot study. Clients who participated in the pilot study were not included in the main study sample.

Ethical considerations:

- An approval to conduct the study was obtained from the Ethical Research Committee, Faculty of Nursing, Menoufia University.
- An official permission for data collection in the form of official letter was obtained from each client.
- Participants were informed that their information will be used for research purpose only.
- All participants were assured about the confidentiality and anonymity of their data. They were informed about their right to withdraw from the study at any time without giving any reason.

Procedure: -

1) An official letter was submitted from the Dean of the Facultyof Nursing, Menoufia University to the director of Menoufia University Hospital explaining the purpose and methods of data collection

2) Data was collected through a period of 6 months from the beginning of October 2020 to the end of March 2021.

3) Assessment was done to the study participants who came to the previously mentioned settings and agreed to participate in the study.

4) The researcher introduced himself to the participants and explain the purpose of the study and assured them about confidentiality of information and their right to withdraw at any time.

5) After enrollment, study participants were asked to fill the study instrument individually in the presence of the researcher to provide any needed clarification. The assessment was done using a structure interview questionnaire, health literacy scale and reported health related behavior scale.

6) The interview conducted whenever possible in privacy and using simple language, the average number per day around 5-10 clients and each client take an average of 20-30 minute.

7) All study participants were interviewed in outpatient clinic (2 days per week).

8) The questionnaire was distributed to the participants who can read and write to fill it.

9) The participants who cannot read and write; the questionnaire filled by the researcher.

Statistical analysis: -

Data was organized and coded for the entry and analysis using SPSS statistical software package version 24. Data was presented using descriptive statistics in the form of numbers and percentages; means and standard deviations. For non-parametric variables, a chi-square test was used to test the difference in the responses of each individual item of health literacy scale and health related behavior scale. Person r was used to test the correlation between the total score of health literacy and total score of health-related behavior scale. The significance level was chosen as ($p < 0.05$).

Results:

Table 1 Shows distribution of the socio-demographic characteristics of the studied sample. From the table, the mean age of the studied sample was 43.54 ±10.57 and two thirds of them (69,7%) had secondary and university education. Regarding their occupation, slightly less than two thirds (65.6%) were working, 63.9% had enough income and majority of them (78.0%) were married.

Table 2 Reveals that distribution of the studied sample according to chronic diseases, taking their medication, previous hospital admission and family history of chronic diseases. 52.3% of the study sample had hypertension about, 44.4% taking their medication regularly, 10% previously admitted to the hospital, 48.1% had family history while, 70.5% disease control and 72.2% had regularity of follow up.

Figure 1 Represents the distribution of the studied sample according to the source of health information. From the figure more than half (57.3%) of the studied sample obtain their health information from health care providers, while the lowest percentage of them (2.5%) take their health information from family members and friends.

Table 3 Shows that 79.7, 76.8, 75.9, 63.9, 63.5, 61.4, 58.1, 57.7 and 51.9 of studied sample easily understood what the doctor said, why health screenings is needed, the instruction provided by doctor's and pharmacist's about prescribed medicine, followed the instructions from the doctor or pharmacist, understand the health advice from family members or friends, understood health warnings behavior, found information on treatments for illnesses of concern, used information the doctor gives to make decisions about the illness of concern and found out the activities that are good for mental well-being . While 58.5, 55.6, 53.9, and 52.3 reported that somewhat difficult to find information to manage mental health

problems like (stress or depression), judged if the health information of health risks in the media is reliable, judged when second opinion from another doctor is needed, and found out where to get professional help during illness; with mean score was 23.55 ± 5.50973 out of 32.

Figure 2 Shows the distribution of studied sample according to their level of health literacy. Less than half of the studied sample (47.7%) had good health literacy, while 39.4 had fair health literacy, 12.9% had poor health literacy. The finding of the figure provide answer to research question number one.

Table 4 Reveals the total means score of health-related behavior subscales about nutrition among study sample. The total mean score of nutrition subscale was 12.83 ± 2.90 out of 20, total mean score of physical activity and sports practice was 3.20 ± 1.39 out of 6, total mean score of relaxation and behaviors related to mental health was 8.99 ± 2.04 out of 14 and total mean score of preventive behaviors was 12.91 ± 5.19 out of 23.

Figure 3 Shows that distribution of studied sample according to their level of health-related behaviors. From the figure 60.6% of studied sample had moderate health related behavior, 30.3% low health related behavior and while only 9.1% high health related behavior. The finding of the figure provide answer to research question number two.

Figure 4 Represents the relationship between total score of health literacy and total score of health-related behaviors. There was a statistically significant positive correlation between health literacy and health related behaviors, that indicated increased health literacy level is associated with increased health-related behaviors. The finding of the figure provide answer to research question number three.

Table 5 Represents the relationship between age of the studied sample and the total score of health literacy and health -related behaviors score. From the table there was a statistically significant negative correlation between age of the studied sample and health literacy and health related behaviors (P=0.004). This mean that younger people have good level of health literacy and health- related behaviors.

Table 6 Illustrated that there was a positive relationship between occupation and total mean score of health literacy score and also between health-related behaviors score. Moreover, there was a positive relationship between level of education and total mean score of both health literacy and health-related behaviors. This mean that employee have good health literacy and health- related behavior. The finding of table 5 and 6 provide answer to research question number four.

Table 1: Distribution of studied sample according to the socio-demographic characteristics (N=241).

Variables	No	%
Age		
> 30	33	13.7
30 to less than 50	138	57.2
50 or more	70	29.0
Mean ± SD	43.54 ± 10.57	
Gender		
Male	121	50.2
Female	120	49.8
Occupation		
working	158	65.6
Not working	83	34.4
Education		
Can't read and write	35	14.5
Basic education	32	13.2
Secondary school education	81	33.6
University education	87	36.1
Post-university education	6	2.5
Marital Status		
Single	53	22.0
Married	188	78.0
Residence		
Urban	185	76.8
Rural	56	23.2
Income		
Not enough	73	30.3
Enough	154	63.9
Enough and save	14	5.8

Table 2: Distribution of studied sample according to their medical history (N= 241).

Variables	Yes		No	
	No	%	No	%
Having chronic disease				
Cardiovascular disease	52	21.6%	189	78.4%
Hypertension	126	52.3%	115	47.7%
Diabetes	124	51.5%	117	48.5%
Obesity	63	26.1%	178	73.9%
Atherosclerosis	22	9.1%	219	90.9%
Talking medication regularly				
Cardiovascular disease	45	18.7	196	81.3
Hypertension	107	44.4	134	55.6
Diabetes	123	51.0	118	49.0
Obesity	23	9.5	218	90.5
Atherosclerosis	12	5.0	229	95.0
Hospital admission				
Cardiovascular disease	23	9.5	218	90.5
Hypertension	24	10.0	217	90.0
Diabetes	29	12.0	212	88.0
Obesity	1	0.4	240	99.6
Atherosclerosis	0	0	241	100
Family history of chronic diseases				
Cardiovascular disease	56	23.2	185	76.8
Hypertension	116	48.1	125	51.9
Diabetes	102	42.3	139	57.7
Obesity	33	13.7	209	86.3
Atherosclerosis	19	7.9	222	92.1
Disease control	170	70.5	71	29.5
Regularity of follow up	174	72.2	67	27.8

Figure 1: Distribution of the studied sample according to source of health information (N=241).

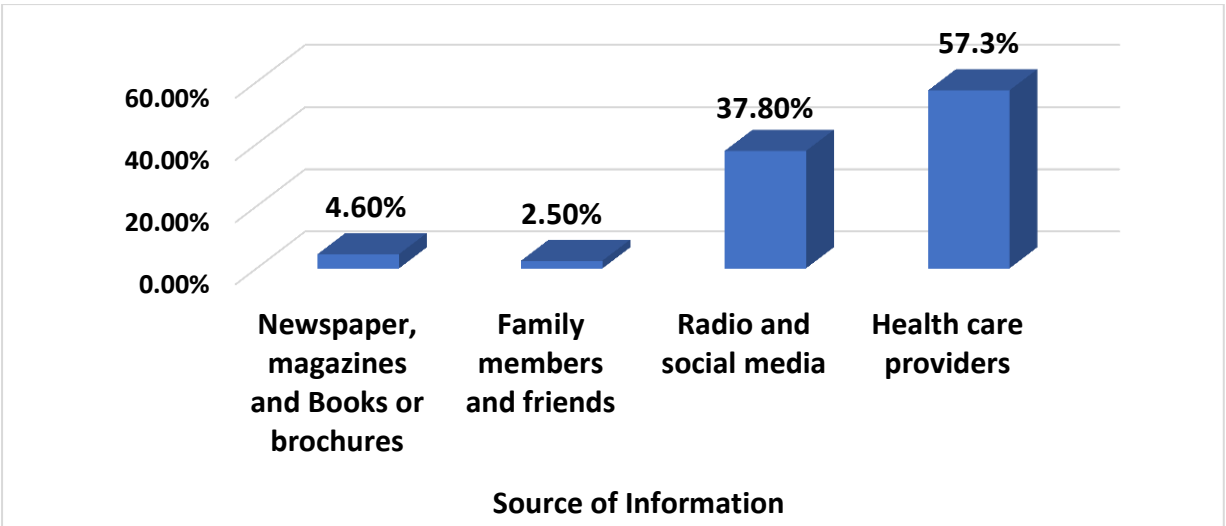


Table 3: Distribution of the studied sample according to their responses to health literacy scale (N=241).

Statement Total score = 32	Difficult		Somewhat difficult		Easy	
	No	%	No	%	No	%
1- Find information on treatments for illnesses of concern	13	5.4	88	36.5	140	58.1
2- Find out where to get professional help during illness	18	7.5	126	52.3	97	40.2
3- Understand what the doctor says	16	6.6	33	13.7	192	79.7
4- Understand the instruction provided by doctors and pharmacists about prescribed medicine	10	4.1	48	19.9	183	75.9
5- Judge when second opinion from another doctor is needed	43	17.8	130	53.9	68	28.2
6- Use information the doctor gives to make decisions about the illness of concern	11	4.6	91	37.8	139	57.7
7- Follow the instructions from the doctor or pharmacist	11	4.6	76	31.5	154	63.9
8- Find information to manage mental health problems like (stress or depression)	22	9.1	141	58.5	78	32.4
9- Understand health warnings behavior	16	6.6	77	32.0	148	61.4
10- Understand why health screenings is needed	10	4.1	46	19.1	185	76.8
11- Judge if the health information of health risks in the media is reliable	19	7.9	134	55.6	88	36.5
12- Decide how you can protect yourself from illness based on information in the media	21	8.7	117	48.5	103	42.7
13- Find out the activities that are good for mental well-being	20	8.3	96	39.8	125	51.9
14- Understand the health advice from family members or friends	15	6.2	73	30.3	153	63.5
15- Understand information in the media on how to get healthier	9	3.7	113	46.9	119	49.4
16- Judge which everyday behavior is related to your health	10	4.1	120	49.8	111	46.1
Mean Total Score	23.55 ± 5.50973					

Figure 2: Distribution of studied sample according to their level of health literacy (N=241).

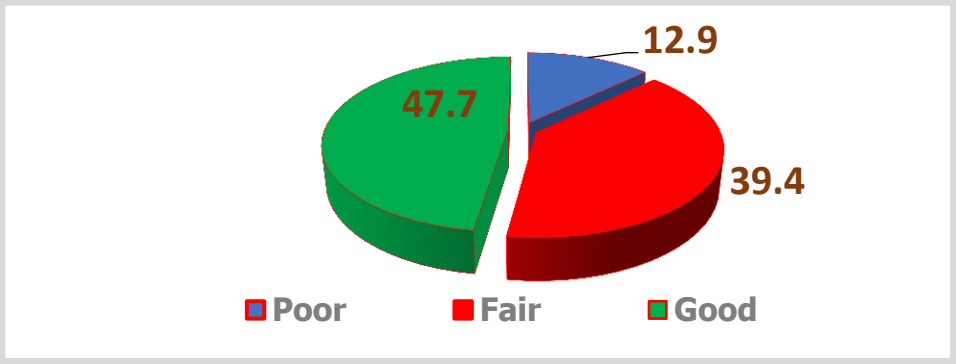


Table 4: Total mean score of health-related behaviors subscales (N=241).

Subscales	Minimum	Maximum	Mean ± SD
Nutrition (total score=20)	5.00	20.00	12.83 ± 2.90
Physical activity and sports practice (total score=6)	0.00	6.00	3.20 ± 1.39
Relaxation and behaviors related to mental health (total score=14)	1.00	14.00	8.99 ± 2.04
Preventive behaviors (total score=23)	0.00	23.00	12.91 ± 5.19

Figure 3: Distribution of studied sample according to their level of health-related behaviors (N=241).

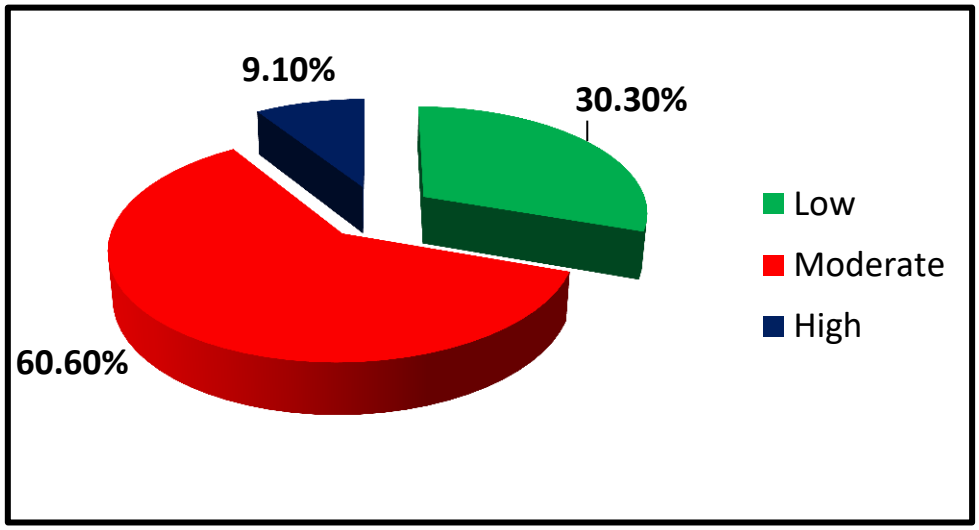
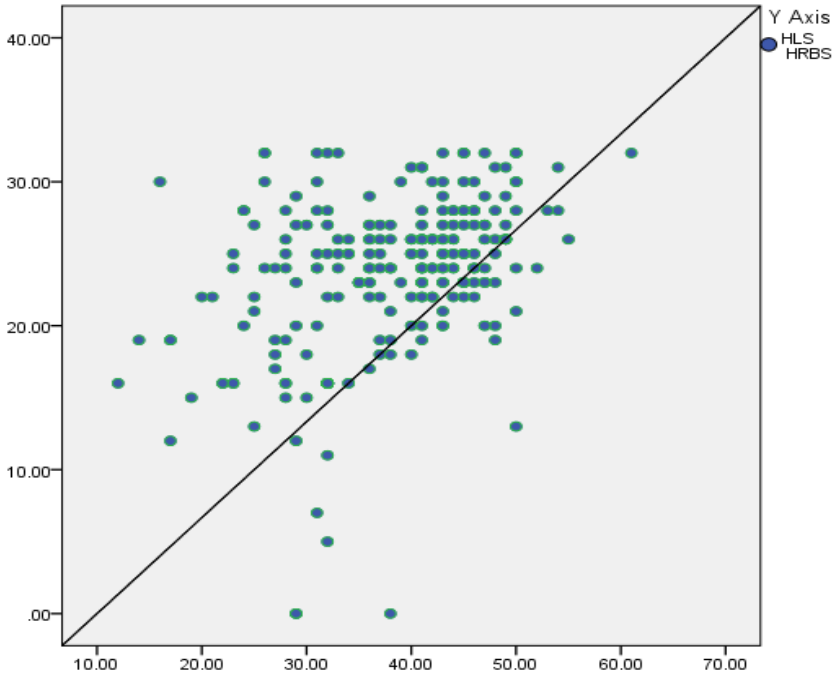


Figure 4: Relationship between total score of health literacy and total score of health- related behaviors (N=241).



P = 0.000	r = 0.395

Table 5: Relationship between age of the studied sample and total score of health literacy and health- related behaviors score (N=241).

	Health Literacy score		Health related behaviors score	
	r	P	r	P
Age	-.060	.357	-.184**	.004*

****. Correlation is significant at the 0.01 level (2-tailed).**

**** P value = 0.004.**

Table 6: Comparison between different occupation and education level of studied sample regarding to total mean score of health literacy and reported health- related behaviors score (N=241).

		Sum of Squares	df	Mean Square	F	P
Occupation						
Total Health Literacy Score	Between Groups	334.421	5	66.884	2.261	0.049
	Within Groups	6951.280	235	29.580		
Health Related Behaviors Score	Between Groups	903.488	5	180.698	2.445	0.035
	Within Groups	17367.449	235	73.904		
Education						
Total Health Literacy Score	Between Groups	1055.860	5	211.172	7.966	0.000
	Within Groups	6229.841	235	26.510		
Health Related Behaviors Score	Between Groups	1976.174	5	395.235	5.700	0.000
	Within Groups	16294.764	235	69.339		

Discussion

Health literacy is a major international public health concern. It has become an important topic in today's health care environment. Low health literacy is a global issue due to its role in the decisions made by people in health-related fields, promoting health literacy is one of the main tools in the hands of policymakers to promote the level of health within the societies and improve the quality of health services (Joveini et al., 2019; Asharani et al., 2021). Thus, this study conducted to determine the relationship between health literacy and health related behaviors among clients with chronic diseases.

Regarding the socio-demographic characteristics of the studied sample, the present study showed that the mean age of the study sample was 43.54 ± 10.57 57, more than half of them their age ranged between 31-50 years old, the majority of them (69,7%) had secondary and university education, 78.0% were married, while 52.3% of the study sample had hypertension, 51.5% had diabetes, 26.1% had obesity, 21.6% had cardiovascular disease and 9.1% had atherosclerosis.

Regarding the source of health information of studied sample, the current study revealed that more than half of the studied sample obtain their health information from health care providers. This finding was in line with Chen et al., (2018) they investigated the association between people's health literacy and their use of and levels of trust in health information sources in US adults; they found that most of participants (90.22%) used and trusted health information from primary care providers. also, the current finding was in line with Oedekoven et al., (2019) they identify the source of information used by German patients for health-related questions and their health literacy level; they found that 72.1% of the participants stated that the general practitioners were the source of choice for health-related questions. moreover, Han, (2017), who examine the associations between HL, health information access, and health care choices when people feel ill in China, who reported that the source of health information was usage of the books or brochures from professional, this indicated that his findings was in agreement with the current study findings. This agreement may be due to health care providers play the major role in providing health care services to clients both in developed and non-developed countries. Health care professionals may be the most frequently and trustfully source of information among clients.

Concerning the health literacy level, the current study reported that about approximately less than half of studied sample had good health literacy level. This finding was in the same line with the study conducted by Joveini et al., (2019) to determine the level of health literacy among literate adults in Bardaskan city, Iran; they reported that the health literacy level was adequate in 39.4% of the participants; Nezafati et al., (2020) they determined the level of health literacy of elderly members of the National Retirement Fund of Rasht City, Iran; they reported that 54.8% had adequate health literacy. This may be due to that educated people more tend to seek health information and health awareness than uneducated people. In contrast to current finding, Awad et al., (2018) they assess health literacy and health risk behaviors among elderly at Assiut city, Egypt; Aldosokey et al., (2021) they assess the relation between health literacy and health promoting behaviors among elderly at Tanta city, Egypt; the findings of both studies revealed that about two thirds of the studied sample had low health literacy level; Šulinskaitė et al., (2022) they investigate patients' health literacy levels and assess the relationship between health literacy and health behavior in primary care settings in Kaunas city, Lithuania; they reported 40.6% of respondents had inadequate or problematic health literacy . This may be due to the difference in age groups of current findings and both of these studies, also younger clients may have more access to get health information and health care system.

Regarding the reported health-related behavior, the current study revealed that more than sixty percentage of studied sample had moderate health-

related behavior. This finding was in agreement with Aldosokey et al., (2021); they reported that more than half of the studied sample had moderate level of adherence to health promoting behaviors; Thummakul & Pumtha-it, (2021) they study the level of health literacy, health behavior, and the correlation between health literacy and health behavior of the elderly in BangPhlat district, Bangkok; they found most of their sample had high health behavior level; the difference between the finding of their study and the findings of current study may be attributed to the difference of sociodemographic characteristic of their sample and sample of current study. In contrast to current finding, Mofrad et al., (2016); they identify behaviors of health promotion and chronic diseases of aging in the elderly people in Iranshahr-Iran, they found that more than half of their sample have inappropriate health promoting behaviors. This may be attributed to the difference of mean age of current study subjects and their subjects since the younger people tend to have more sense of concern about their health and more engaged in healthy lifestyle practices.

Regarding relationship between health literacy level and reported health-related behaviors level, the current study revealed that there was a statistically significant positive relationship between health literacy and health related behaviors. This finding was in agreement with the finding of Xie et al., (2022) who explore the relationships between health literacy and health-related behaviors, among Chinese elderly; they found statistically significant associations between health literacy level and health-related behaviors; also, Šulinskaitė et al., (2022) found that health behavior significantly correlated with all indices of health literacy. moreover, same results reported by Liu et al., (2015) they study the relationship between health literacy and health-related behaviors and health status in Chinese elderly; they found that the participants with higher health literacy scores were significantly less likely to have risky behaviors. This can be clarified as health-related behaviors is influenced by health literacy level especially those with chronic disease.

Regarding the relationship between ages of the studied sample and total mean score of health literacy and reported health related behaviors; the current study revealed a statistically significant negative correlation between age of the studied sample and health literacy and health related behaviors. This finding was in agreement with Xie et al., (2022) they found that age, residence, and education level were associated with high health literacy level. also, Aldosokey et al., (2021); they reported that the elderly people had inadequate health literacy. Moreover Šulinskaitė et al., (2022) they reported that better health literacy was observed among younger patients. This may be due to younger people tend to seek different sources of health literacy than older people and tend to engage in healthy practices to maintain good behavior and healthy appearance.

Regarding gender of the study sample, the current study revealed that there was no difference between male and female regarding health literacy scale and health related behaviors scale. This finding was in agreement with the findings Joveini et al., (2019), they reported that gender and level of health literacy didn't show any significant relationship. Also, Zhang et al, (2021) who obtain valuable insights for tailoring educational programs to promote public health among individuals from different districts of Hong Kong; they found no significant sex difference in different health literacy domains. Also, Han, (2017) who examine the associations between health literacy, health information access, and health care choices among ill Chinese people, there was no gender difference with any of the health literacy variables. This may be male and female have the same concern in healthy related issues.

Regarding the relationship between occupation of studied sample and health literacy and health related behaviors, the current study revealed that there was a positive relationship between occupation and total mean score of health literacy and health-related behaviors. This finding was in agreement with the findings of Liu et al., (2015) they studied the relationship between health literacy and health-related behaviors and health status in Chinese older adults; they reported that older adults with professional occupations tended to have higher health literacy scores. this may be due to their communication with peers may provide chance to acquired new information and culture that enhance the adherence with healthy behaviors and healthy lifestyle.

Regarding the relationship between levels of education of studied sample and total mean score of health literacy scale and health related behaviors score, the current study revealed that higher education is association with high literacy level and reported health related behavior .This finding was similar to the findings of Jansen et al., (2018) they studied the association between education and out-of-hours primary care services use among people with chronic condition in Netherlands; they found that higher education attainment was associated with higher scores on the health literacy aspects. Also, Raghupathi & Raghupathi, (2020) who explore the association between education and health over a 20-year period for countries around the world. They found adult with high education level had better health and lifespans compared to less-educated. This may be attribute to education enables people to develop a broad range of skills and traits that enhance their awareness of healthy behaviors.

Conclusion

A statistically significant positive correlation between health literacy and reported health-related behaviors was found. Also, there were a positive relationship between occupation, level of education and total mean score of health literacy and health-related behaviors.

Recommendations

Based on the findings of the current study the following recommendations were suggested:

- Programs should be designed and implements programs to improve health literacy and health- related behaviors of clients with chronic condition are essential in different health care setting.
- Conduct further studies to investigate the effect of educational program on health literacy level and practice of health-related behavior.

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