Patients' Knowledge about Chronic Diseases towards Risk Factors and Warning Signs of Stroke

Sadiq A. Hassan, MSc.N*
Widad K. Mohammed, PhD**

الخلاصـة:

الهدف: تقييم معارف الأشخاص المصابين بالأمراض المزمنة تجاه عوامل الخطورة والعلامات المحذرة للجلطة الدماغية، وتحديد العلاقة بين هذه المعارف والصفات الديموغرافية الاجتماعية لهؤلاء الأشخاص.

المنهجية : أجريت دراسة وصفية في العيادات الطبية الشعبية للمدة من ٢ كانون الأول ٢٠٠٨ ولغاية ٨ آب ٢٠٠٩. اختيرت عيّنة غير احتمالية "غرضية" من (٣٠٠)شخصاً من المراجعين للعيادات الطبية الشعبية والمصابين بواحد أو أكثرمن الامراض المزمنة كارتفاع ضغط الدم وداء السكري وأمراض القلب والجلطة الدماغية في مدينة بغداد.
جمعت المعلومات من خلال استعمال استبانة مصممة ومكونة من ثلاثة اجزاء، جزء شمل صفحة البيانات الديموغرافية الاجتماعية ويحتوي (٧) فقرات وجزء شمل صفحة المعلومات الطبية المكوّن من (١٠) فقرات وجزء شمل صفحة المكونات الأساسية الثلاث للدراسة (التعريف والعلامات المحذرة وعوامل الخطورة للجلطة الدماغية) المتكون من (٦٢) فقرة، وجمعت المعلومات بطريقة المقابلة المباشرة مع الأشخاص المصابين بالأمراض المزمنة. استعملت إجراءات التحليل الإحصائي الوصفي (التكرارات، النسبة المئوية، الوسط الحسابي، الانحراف المعياري، والكفاية النسبية) وإجراءات التحليل الاستنتاجي (معامل الارتباط، معامل التوافق، اختبار مربع كاي، واختبار فشر) في تحليل البيانات.

النتائج: أظهرت نتائج الدراسة أنّ هناك نقصاً وقلة في معلومات مرضى الأمراض المزمنة متركزاً بالدرجة الأساس في جانب العلامات المحذرة متبوعاً بجانب عوامل الخطورة للجلطة الدماغية. كما وأظهرت النتائج عدم وجود علاقة معنوية بين معارف مرضى الأمراض المزمنة وبين (الجنس والمهنة)، بينما أظهرت النتائج وجود علاقة معنوية بين معارف مرضى الامراض المزمنة وبين (العمر والمستوى التعليمي).

التوصيات: أوصت الدراسة بضرورة إعداد وتصميم برامج وحملات توعوية مكثفة عن الجلطة الدماغية تتصف بكونها ذات توجّهٍ جماهيري واسع النطاق يعتمد الأدلة العالمية المعتمدة ذات العلاقة وذات توجّهٍ إلزامي تستهدف زيادة مستوى معارف ووعي الشرائح الأكثر عرضة لخطر الإصابة بالجلطة الدماغية لا سيما شريحة الأشخاص المصابين بالامراض المزمنة، فضلا عن المسنين وذوي المستوى التعليمي المتدني، فضلاً عن عامّة الناس.

Abstract

Objectives: to assess chronic diseases patients' knowledge toward stroke risk factors and warning signs, besides determining the relationship between chronic diseases patients' knowledge and their sociodemographical characteristics.

Methodology: A descriptive study was carried out at public medical clinics which has started from December 2nd, 2008 to August 8th, 2009. A purposive "non-probability" sample of (300) chronic diseases individuals who were clients of Public Medical Clinics who have one or more of the following chronic diseases (hypertension, diabetes mellitus, heart diseases, and previous stroke), in Baghdad city. The data were collected through the use of a constructed questionnaire which consists of three parts (1) Sociodemographic data form that consist 7-items (2) Medical data form that consists of 10-items and (3) Main domains of the studied phenomena form consists of 3-sections (domains) of definition, warning sings, and risk factors of 62 items, by means of direct interview technique with the chronic diseases patients. Descriptive statistical analysis procedures (frequency, percentage, mean of scores, standard deviation, and relative sufficiency) and inferential statistical analysis procedures (pearson correlation coefficient, contingency coefficient, Chi-square test, and Fisher exact probability test) were used.

Results: The findings of the study indicated that there is a knowledge deficit of chronic diseases patients mainly in stroke warning signs followed by stroke risk factors. No significant relationship was found between chronic diseases patients' knowledge and their gender, employment, while significant relationship was found between chronic diseases patients' knowledge and their age and level of education.

Recommendations: The study recommends that an intensive comprehensive, evidence-based obligatory wide population-based health education programs are needed to improve awareness of stroke, especially among the most vulnerable groups (chronic diseases patients), eldeely, and less educated persons as well as lay people.

Keywords: Knowledge; Chronic Diseases; Risk Factors; Warning Signs; Stroke

*** Assistant Instructor, Adult Nursing Department, College of Nursing, University of Baghdad**
****Assistant Professor, Head of Adult Nursing Department, College of Nursing, University of Baghdad**

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Introduction:

Stroke is a global problem that requires an approach with evidence-based measures [1]. Stroke is defined as a sudden, non-convulsive focal neurological deficit [2]. Globally, stroke is the second most common cause of death exceeded only by heart diseases [3]. It has been recorded that annually, 15 million people worldwide suffer from stroke. Out of these, 5 million attain optimal recovery, 5 million die, and 5 million suffer from a long lasting disability, placing a huge burden on families and communities [4]. In Asia, the problem of stroke has a particularly strong impact, not only because more than the half of the world's population lives in Asia, but also stroke is the predominant vascular disease in many parts of Asia [5]. Stroke is a complex and heterogeneous disease with multiple risk factors [6]. In a study conducted in the United States founds that almost 40% of patients who were admitted with a possible stroke did not know the signs, symptoms, or risk factor of a stroke. Therefore, further public education is needed to increase awareness of the warning signs and risk factors of stroke [7]. Despite recent advances in stroke therapy, the majority of stroke patients don't seek immediate medical attention even in developed countries like USA, UK, and France there is a lack of knowledge among stroke patients about warning symptoms and risk factors [8]. Nurses have a unique opportunity to help clients, examine their lifestyle, recognize risks and potential areas for change, advice on a focused individualized plan and facilitate the accomplishment of their goals [9]. Nurses are becoming more involved in community education through outreach programs directed at assisting the public to learn about stroke, identify risk factors, and teach individuals methods to adopt a healthy lifestyle to reduce their risk of suffering a stroke [10]. Assessment of the current level of public knowledge can help in the design of education programmes and can also provide a useful baseline data against which to judge the possible contribution of education programmes [11].

Methodology:

A purposive "non-probability" sample of 300 chronic diseases individuals who were clients of Public Medical Clinics and diagnosed with one or more of these major chronic diseases (hypertension, diabetes mellitus, heart diseases, and previous stroke), were involved in the present study. Data were collected by using the constructed questionnaire and the structured interview technique as a mean for data collection. The questionnaire was constructed by the investigators to achieve the early stated objectives, which consisted of three parts; the first part is concerned with the socio-demographic characteristics of the chronic diseases patients which included; age, gender, marital status, educational level, current employment status, resident area (sector) in Baghdad city and monthly income; the second part is focused mainly on identification of which chronic diseases the patient got and the duration of each one, client health seeking habits, clients' family medical history, client major sources of health-related knowledge focused mainly on chronic illnesses, especially stroke.; the third part of the questionnaire was comprised of (3) major parts that were concerned with knowledge of patients with chronic diseases toward risk factors and warning signs of stroke, whereas the first part consisted of (6) items focused in its content towards stroke as a term or concept definition, besides stroke simple general information. While, the second part is composed of (15) items which are purely directed to warning signs of stroke. Followed by the third part contain (41) items concerned with both modifiable and non-modifiable stroke risk factors.

These items were measured, scored and rated of 3-level Likert rating scale; agree (3), uncertain (2), disagree (1), whereas the higher grade scoring of the questionnaire mean of

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scores (MS), relative sufficiency (RS) the greater knowledge toward risk factors and warning signs of stroke. The validity and reliability for the constructed questionnaire were determined by using pilot study and the experts panel, and the application of Pearson correlation coefficient (r = 0.84) which was statistically acceptable. Data were analyzed through the application of descriptive statistical analysis (Frequency, Percentage, Mean of scores, relative sufficiency and Standard deviation) and inferential statistics (Pearson correlation coefficient, contingency coefficient, and Fisher exact probability test) [12]. The sample has been selected based on the following criteria:

1. Those patients with medically confirmed diagnosis of one or more of the following major chronic diseases: hypertension, diabetes mellitus, heart diseases, since at least one year ago.
2. Those patients with medically confirmed diagnosis of previous stroke, for at least one year ago.
3. Those individuals who visit Public Medical Clinics.
4. Adults who are (18) years of age and older.
5. Those clients who are free from mental illness.

Results

Table 1. Distribution of patients with chronic diseases by their sociodemographic characteristics

Sociodemographic characteristics		Frequency	Percent	Cumulative Percent
Age Groups	< 30	2	0.7	0.7
	30 - 39	11	3.7	4.3
	40 - 49	51	17	21.3
	50 - 59	112	37.3	58.7
	60 - 69	83	27.7	86.3
	70 >	41	13.7	100
	Mean of age: 58.2 year – Standard deviations: 10.6			
Gender	Male	189	63	63
	Female	111	37	100
Education Level	Do not read and write	65	21.7	21.7
	Read and write	44	14.7	36.3
	Primary school	43	14.3	50.7
	Intermediate	43	14.3	65
	Secondary school	32	10.7	75.7
	Institute	38	12.7	88.3
	College-post graduate	35	11.7	100

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Table 1. (Continued)

Sociodemographic characteristics			Frequency	Percent	Cumulative Percent
Employment		employed	128	42.7	42.7
		Unemployed	172	57.3	100
Employment Status	Employed	official	71	23.7	23.7
		craftsman	57	19	42.7
	Un employed	retired	70	23.3	66
		house wife	71	23.7	89.7
		standing	31	10.3	100
Marital Status		married	182	60.7	60.7
		single	23	7.7	68.3
		divorce	21	7	75.3
		widower	74	24.7	100
Residency		Al- karkh	132	44	44
		Al- Rusafa	168	56	100
Monthly income		sufficient	52	17.3	17.3
		insufficient	158	52.7	70
		barely sufficient	90	30	100

The results indicated that the sample of chronic diseases patients consisted of 300 ones. The majority (37.3%) was 50-59 years old, (63%) was male, (21.7%) was illiterates, (57.3%) was unemployed, whereas (23.7%) was official employees, and the same previous percentage was housewife, (60.7%) was married, (56%) as Al-Rusafa residents, and it was found also that (52.7%) of them had insufficient income.

Table 2. Summary statistics of the main domain's responding of chronic diseases patients

Domains	Mean	Standard Deviation	R.S. (%)
Stroke definition domain	2.33056	0.3786	77.68533
Stroke warning signs domain	1.97711	0.48425	65.90367
Stroke risk factors domain	2.00732	0.3034	66.91067
Whole domains	2.10499	0.30493	70.16633

RS= Relative Sufficiency; %= Percent

This table reveals in term of mean of scores, standard deviation and the relative sufficiency in light of current study cut-off-point (66.66%) that subjects responses regarding the stroke definition domain is above the cut-off-point (77.69%), but the subject responses in concerned with stroke warning signs are under the cut-off-point (65.90%). While, subjects' responses, which relate to the third domain "stroke risk factor domain" are critically above the cut-off-point (66.91%). From a statistical point of view, such value considered critical since it's very close to the cut of point. Finally, with respect to whole domains of the study, the subjects' responses are almost above the cut-off-point (70.16%).

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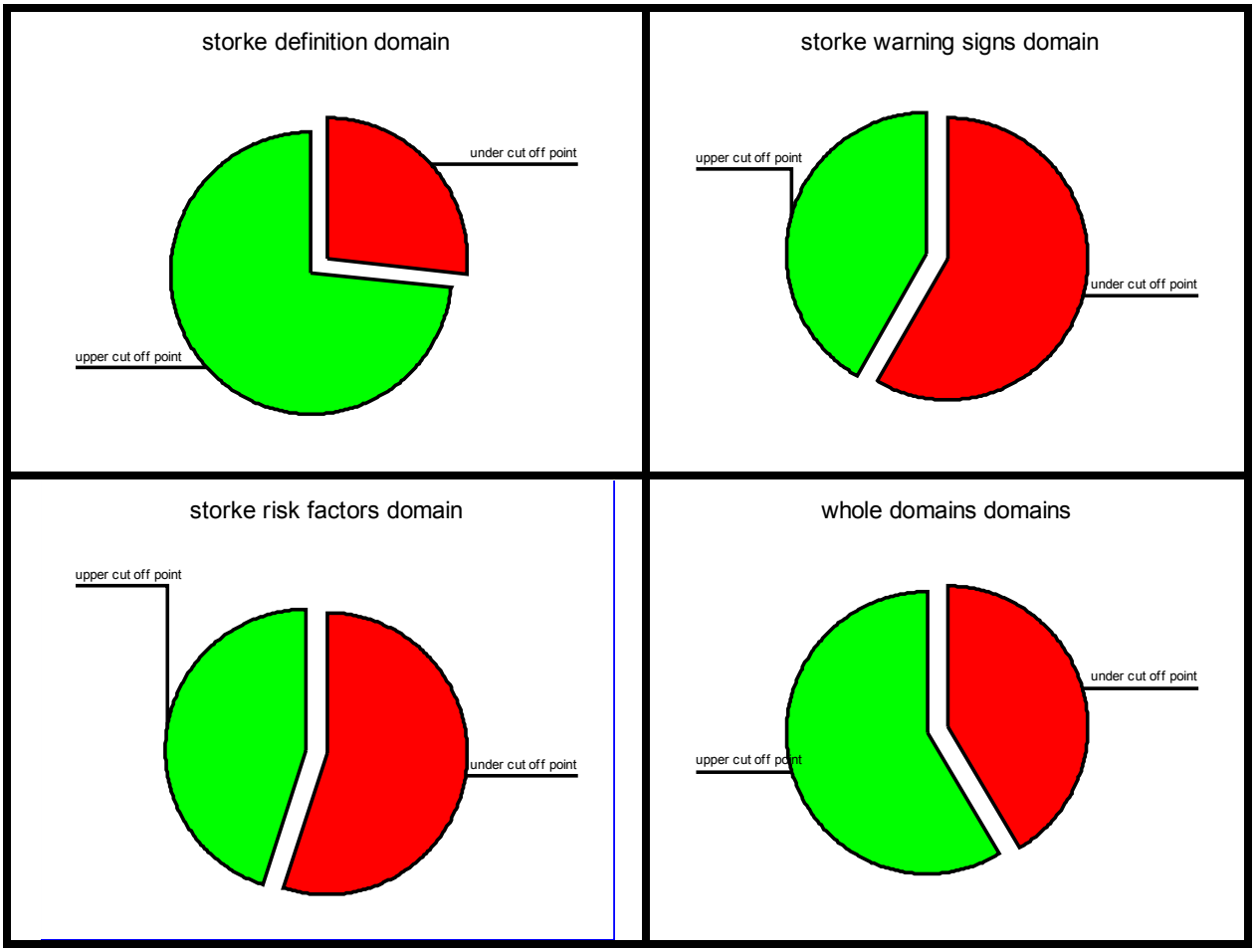


Figure 1. Observed frequencies related to under and upper the cut-off-point

Table 3. Mean of scores and relative sufficiency of chronic diseases individuals' knowledge concerning definition, warning signs, and risk factors of stroke

List	Items	M.S	R.S
1	**stroke definition domain**		
1.1	Partial death of brain resulting from either hemorrhage or thrombus in the blood vessels which feeding it	2.64	88.00
1.2	An urgent critical medical condition resulting from sudden blockage of the blood to the heart*	1.57	52.33
1.3	Total brain death is due due to thrombus or hemorrhage in the brain artery which feeds it*	1.63	54.33
1.4	Stroke affected organ is the brain chiefly	2.13	71.00
1.5	Globally, stroke is the second major cause of death	2.12	70.67
1.6	CVA differs from stroke*	1.71	57.00

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Table 3. (Continued)

List	Items	M.S	R.S
2	**stroke warning signs domain**		
2.1	Sudden numbness or weakness in the face, which may lead to drooling	2.45	81.67
2.2	Sudden loss of strength or sudden numbness in the arm, even if temporary especially on one side of the body	2.32	77.33
2.3	Sudden loss of strength or sudden numbness in the leg, even if temporary, especially on one side of the body	2.1	70.00
2.4	Sudden loss of strength or sudden numbness in both arms and legs	1.96	65.33
2.5	Sudden difficulty in speaking, understanding, or sudden confusion, even if temporary	1.95	65.00
2.6	Sudden Trouble walking	1.94	64.67
2.7	Dizziness	1.83	61.00
2.8	Sudden loss of balance or movement coordination	1.81	60.33
2.9	Sudden severe and unusual headache	1.79	59.67
2.10	Sudden hearing loss	1.72	57.33
2.11	Sudden trouble with vision (double vision), even if temporary in one or both eyes	1.89	63.00
2.12	Dysphagia	1.77	59.00
2.13	Seizures or fits	1.96	65.33
2.14	Transient ischemic attack.	2.06	68.67
2.15	Sudden chest pain*	1.89	63.00
3	**stroke risk factors domain**		
3.1	Hypertension	2.69	89.67
3.2	Diabetes mellitus	2.54	84.67
3.3	Smoking	2.55	85.00
3.4	Excessive alcohol consumption	2.37	79.00
3.5	Heart diseases like MI,HF…etc.	2.35	78.33
3.6	Using of oral contraceptive (birth control pills)	1.93	64.33
3.7	Lack of physical activity and exercises	1.97	65.67
3.8	Sedentary lifestyle	2.01	67.00
3.9	Physical fitness*	2.25	75.00
3.10	Overweight and obesity	2.24	74.67
3.11	Age: Sixty-five years and older	2.06	68.67
3.12	Pregnancy	1.83	61.00
3.13	Non-smoking *	2.29	76.33
3.14	Socioeconomic status	2.12	70.67
3.15	Illegal (illicit) drugs addiction like cocaine	2.12	70.67
3.16	Gender: stroke affects female more than male*	2.07	69.00
3.17	Hyperlipidemia, hypercholesterolemia and dyslipidemia	2.18	72.67
3.18	Psychological stress	2.15	71.67
3.19	Less saturated fatty diet consumption*	2.17	72.33

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Table 3. (Continued)

List	Items	M.S	R.S
3.20	Infection and inflammation such as acute respiratory infections	1.89	63.00
3.21	Psychological comfort*	2.22	74.00
3.22	Young people are more prone to stroke than elderly *	1.98	66.00
3.23	Genetic factor (Heredity)	1.9	63.33
3.24	History of prior stroke of the individual or his/her family	1.75	58.33
3.25	Head injuries such as (RTA, FFH)	1.86	62.00
3.26	Sleep disorders such as: (interruption of breathing during sleep (sleep apnea), sleep duration disturbance)	1.81	60.33
3.27	Migraine headache	1.81	60.33
3.28	Transient ischemic attack	1.92	64.00
3.29	Low blood pressure (Hypotension)	1.88	62.67
3.30	Climate nature and seasonality	1.81	60.33
3.31	Elevated hematocrit and hematological factors	1.97	65.67
3.32	Low salt consumption (low sodium)*	2.14	71.33
3.33	Excessive consumption of saturated fat-rich foods	2.20	73.33
3.34	High salt consumption, too salted foods (high sodium content)	2.12	70.67
3.35	Strenuous physical exertion	2.07	69.00
3.36	Poor diet (unhealthy foods) consumption	2.03	67.67
3.37	Fruits and vegetables consumption*	2.32	77.33
3.38	Having white meats such as fish*	2.27	75.67
3.39	Low blood glucose level (hypoglycemia)*	1.96	65.33
3.40	Therapeutic and diagnostic medical procedures complications	1.95	65.00
3.41	Malignancy	1.88	63.00

M.S= Mean of Scores; R.S=Relative sufficiency, *= Converted score

Table (3) summarizes the subjects responding at the items level. Regarding the items of the stroke definition domain, we can observe that the subjects' responses are distributed equally (50%:50%) since three of six items show defective knowledge in light of subjects responses which is item number (1.2) RS (52.33), MS (1.57) followed by item number (1.3) RS (54.33), MS (1.63) followed by item number (1.6) RS (57.00), MS (1.71). With respect to items of stroke warning signs domain, we can see that the vast majority of the subjects' responses are at the item level shows defective knowledge, whereas such defectiveness is found in eleven items of fifteen items of the whole domain which reflects low level of knowledge at this particular domain of the studied phenomena. These eleven item are (2.10), (2.12), (2.9), (2.8), (2.7), (2.11), (2.15), (2.6), (2.5), (2.4), (2.13), arranged in an ascending order, whereas the item number (2.10) shows the lowest RS (57.33), and MS (1.72). Regarding the items of stroke risk factor domain, results show that 16 item from 41 items are classified under the category of defective knowledge from a statistical point of view, these sixteen items are (3.24), (3.26), (3.27), (3.30), (3.12), (3.25), (3.29), (3.41), (3.20), (3.28), (3.6), (3.40), (3.39), (3.7), (3.31), (3.22), arranged in an ascending order, whereas the item number (3.24) shows the lowest RS (58.33), and MS (1.75).

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Table 4. Sociodemographic Characteristics

Sociodemographic Characteristics	Chronic Diseases Patients' Knowledge		C.S
Age	C.C.	0.203	S
	P-value	0.024	
	Confidence level	0.976	
Gender	C.C.	0.002	N.S
	P-value	0.977	
	Confidence level	0.023	
Level of Education	C.C.	0.359	S
	P-value	0.000	
	Confidence level	1	
Employment	C.C.	0.040	N.S
	P-value	0.491	
	Confidence level	0.509	

C.C= Contingency Coefficient; C.S= Comparative Significance; P-value= probability Level

Table (4) shows that there is no significant relationship between chronic diseases patients' knowledge and their gender and employment; while the table indicated that there is a significant relationship between chronic diseases patients' knowledge and their age and level of education.

Discussion:

Throughout the course of the present study, as shown in table one, it has been noticed that (63%) of the study sample are males and the remaining are females, this could be attributed to a higher attendance by males at the Public Medical Clinics where the sample was taken. The dominant age group of study sample is within (50-59) years old of age group and accounted for (37.3%), subjects age range (26 to 86) years with mean (58.2) years and standard deviation (10.6). This finding comes along with a study entitled with (public awareness of warning symptoms, risk factors, and treatment of stroke in Northwest India) which shows that the distribution of their study sample which was composed of (942) subjects, as 531 (56.4%) were men and 411 (43.6%) were women. The mean age was 40.1 years and S.D was 12.9 (range 15 to 80) [13].

Our point of view that the prominent age group as showed previously in the current study is (50 - 59) years old is that the targeted population is (chronic disease patients) most of them are classified under elderly which is almost normal to find them in such age group.

Concerning the level of education, most of them (21.7%) is illiterate. Such result is an ordinary outcome for our Iraqi society as a result of the tragedy of the political events whom the country had passed through. This result is conflicting another study which is entitled with (perception of risk and knowledge of risk factors in women at high risk for stroke) where their results show that the lowest level of education is some high school or less which is accounted for (8%) of the study sample, while the highest percentage (28.6%) is graduate or professional school [14]. Another study shows that the vast majority (93%) of the subjects report that they have 12 or more years of education. That also is inconsistent with current study result [15].

Relative to employment, the results indicate that more than half of the study sample is unemployed and they account for (57.3%). While, the rest is employed. Furthermore, the greatest percentage of the employed subjects is official employees; the unemployed ones are

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almost housewife and/or retired. The results of another study have found that the highest percentage (72.8%) relative to current professional status was retired [16].

With respect to marital status, the largest proportion is married and it accounted for (60.7%) of the whole sample, whereas one more time this result agree with the study which stated that the largest proportion is married and they accounted for (57.9%) of the whole sample [14].

Regarding residency, the highest percentage of the study sample is living in Al-Rusafa district and they accounted for (56%) of the sample. Consistently, it was found that the greatest percentage of another study sample living in city and it accounted as (74%) of the whole study sample [13].

Concerning the income, the greatest percentage (more than half) of the subject responses is insufficient and it accounted for (52.7%) of the study sample.

In one study which is also interested in the same direction of the current study shows that a total of (33.1%) of the study population earned more than ($75000) annually what represents the top class of their study sample and it is totally disagreed with our findings as indicated earlier [14].

The discussion is based mainly on the study statistical cut-off-point which is equal to (66.66%), and as shown previously in (Table 2). The current study is composed basically from three major domains (stroke definition domain, stroke warning signs domain, stroke risk factors domain). The results shows in light of main domain's subjects responses that regarding the (stroke definition domain); in term of relative sufficiency (R.S); that the subjects' responses were above the cut-off-point (77.68%), such finding revealed that the assessed knowledge; particularly in this domain; were almost accepted on the level of the whole domain. Concerning the second domain (stroke warning signs domain), the results show that subjects' responses were under the cut-off-point (65.90%). Such result leads us toward diagnosing the knowledge deficit at this particular domain. In relative to the third domain (stroke risk factors domain), the results show that subjects' responses were critically above the cut-off-point (66.91%). From a statistical point of view, such value is considered critical since it's very close to the cut-off-point.

Our results lead us to the fact that we are more committed toward knowledge deficit which appears mainly and very clearly in stroke warning signs domain in the first place and stroke risk factor domain. In the second place, besides we don't have to forget to enhance stroke as a term to be more understandable by lay people and most importantly by those who are more risky than others to get a stroke, particularly chronic diseases individuals and to be more focused and committed at the same time on strengthening the stroke awareness as a term of "brain attack" that must be viewed as a medical emergency by everyone. In a study conducted in 2005 which is entitled (knowledge of risk factors and warning signs of stroke) as they conduct a grand review which summarizes the findings of fifteen studies of knowledge of stroke warning signs and risk factors in both high-and low-risk populations. In general, there appears to be low levels of knowledge of both risk factors and stroke warning signs among the studied communities [17].

In a study which aims to determine knowledge at the time of symptom onset regarding the signs, symptoms, and risk factors of stroke in patients presenting to the emergency department with potential stroke, and they conclude that almost (40%) of patients admitted with a possible stroke did not know the signs, symptoms, or risk factor of stroke. Based on that, they indicate that further public education is needed to increase population awareness of the warning signs and risk factors of stroke [7].

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Six items from the first domain (stroke definition domain), subjects responses are distributed equally (50% : 50%) in light of subjects' responses. Moreover, the results revealed that the biggest (MS) value of the subjects' responses were spotted at the item (1.1) which is accounted for (2.64) with the highest (RS) (88.00%). While, the lowest MS value of the subject responses are located at item (1.2) of first domain which has accounted for (1.57) with the lowest (RS) (52.33%).

Our point of view can be summarized through item number (1.2) of the first domain (stroke is an urgent critical medical condition resulting from sudden blockage of the blood to the heart*) which shows the lowest MS and RS, such result may be due to inability of our subjects to differentiate between heart attack and stroke which reflects low level of knowledge, particularly at this item. Also, item number (1.3) which is categorized under the items show a defective knowledge in term of RS (54.33) and low MS (1.63). Another item (1.6) (CVA, differs from stroke*) which also shows low RS (57%) and low MS (1. 71), our rationale for such result is that lack of subjects knowledge regarding stroke as a term even the Arabic term of stroke is well recognizable by lay people but the newly employed term (brain attack) appears relatively unrecognizable by them. Based on that, we need to be more committed toward disseminate such terms by health programs established for this purpose, also we need to strengthen the sense of urgency of stroke by adapting "brain attack" rather than other terms.

Fifteen items from the second domain (stroke warning signs domain), subjects' responses were distributed in term of majority eleven item (2.10), (2.12), (2.9), (2.8), (2.7), (2.11), (2.15), (2.6), (2.5), (2.4), (2.13) arranged in an ascending order, out of fifteen were statistically showing defective knowledge in term of RS and MS. Furthermore, the results show that item number (2.1) (sudden numbness or weakness in the face which may lead to drooling) was the most truly identified item in term of MS value (2.45) and RS (81.67%). While, the item number (2.10) (sudden hearing loss) recorded the lowest MS value (1.57) and lowest RS (57.33%) of the subject responses. Moreover, such result reflects clear knowledge deficit whether at the whole domain level or at the items level. Our rationale for such findings in general that our Iraqi population is not well aware, our population is less knowledgeable. In another word unfamiliar with such term (warning signs), since that large segment of our population is directed toward therapeutic approach rather than preventive approach. From the other hand, the item number (2.1) can be explained as that stroke in term of its symptoms was traditionally synonymous to facial drop or weakness in facial muscles. Since such image implanted in mind of population through mass media (TV-series) that is one of possible explanations of such findings. While, the item number (2.10) was with the lowest MS and RS value which reflects low level of knowledge in this particular item, since it recently presents to be accepted even in professionals scientific debate, and even some specialized research has proven it as a scientific fact, but to lay people its not probable to be familiar with such new stroke warning sings.

In a study presenting the point of view regarding failure to recognize the stroke symptoms, and besides it is an important challenge, up to 70% of patients having a stroke are unaware of it, because of lack of knowledge of symptoms or because they are asleep during onset. Furthermore, family members and/or care givers do not always recognize the common signs of stroke, compounded by a lack of general awareness of the urgency of the condition. This underlies the need for public awareness programmes to increase population knowledge of stroke symptoms and facilitate clients being able to access urgent treatment [18]. The third domain "stroke risk factors domain" consists of 41 items; 16 items of 41 in light of subjects' responses were classified under the category of defective knowledge. From a statistical point

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of view, these 16 items are (3.24), (3.26), (3.27), (3.30), (3.12), (3.25), (3.29), (3.41), (3.20), (3.28), (3.6), (3.40), (3.39), (3.7), (3.31) and (3.22) arranged in an ascending order. From the other hand, (hypertension) item number (3.1) which hold the first place of being recognizable by the subjects of the present study in light of the used statistical parameters. Whereas, RS value (89.67%), MS value (2.69) followed by item number (3.3) which represent (smoking). Whereas, RS value (85.00%), MS value (2.55) followed by item number (3.2) which represent (diabetes mellitus). Whereas, RS value (84.67%), MS value (2.54) followed by item number (3.4) which represent (excessive alcohol consumption). Whereas, RS value (79.00%), MS value (2.37) followed by item number (3.5) which represent (heart diseases like MI, HF…etc.). Whereas, RS value (78.33%), MS value (2.35). While, the items which show the lowest RS, MS value are items number (3.24), (3.26), (3.27), and (3.30) which represent (history of prior stroke of the individual or his/her family, sleep disorders, migraine headache, and climate nature and seasonality). Whereas, RS value (58.33%), MS value (1.75) for the item number (3. 24) followed by items number (3.26), (3.27) (3.30). Whereas, their RS value (60.33%), MS value (1.81).

A study findings show that, in term of organ affected in stroke, which is represented in item number (1.4), (Table 3) that only one third of the subjects interviewed recognize that the organ injured in stroke is brain. Also, they add that the most common warning symptom described by the subjects is paralysis of one side of the body 91 (62%). Fifty subjects (34%) identified one symptom correctly, 42 (29%) identified two symptoms, only 12 (8%) know three or more symptoms. While, 43 (29%) do not know even a single warning symptom. Besides, their findings show that hypertension 79 (54%) and diabetes 45 (31%) were the two most common risk factors identified by the study cohort. Only, 55 (37%) of the subjects could identify one risk factor correctly, 31 (21%) subjects could identify two risk factors and only 19 (13%) could identify 3 or more risk factors [8].

Another study findings indicate that almost more than 45% of the participants is able to correctly report two or more stroke risk factors; smoking (50%) and high blood pressure (44%) are reported most frequently [15].

Age, as a variable under study as shown in (Table 4) presents the relationship between chronic diseases patients' knowledge and their ages. It shows that there is a significant relationship at P-value (0.024) between age group and chronic diseases patients' knowledge (C.C. =0.203) mainly at (50-59) year.

Our point of view in explaining such findings is that our targeted population is (chronic diseases patients) (hypertension, diabetes mellitus, heart diseases, previous stroke) most of them are classified under older adults or elderly. Based on that, we presume that such segment will be more knowledgeable than other age groups, since the nature of chronic disease impose itself on the patient in term of health-related information seeking either by frequent contact with their health care provider or other potential sources, that's because the chronic diseases complications become more aggressive with advancing age, such habits less prominent in younger age groups, subsequently all the above may justify such finding.

It was found that those subjects ≥ 65 years are less likely to know a sign or symptom of stroke than those aged <65 years (percentage not knowing a single sign or symptom, 47% versus 28%, P-value = 0.016). Similarly, 43% of patients do not know a single risk factor for stroke. The elderly are less likely to know a risk factor than their younger counterparts. This means that such findings disagree with ours [7]. It is stated that the respondents aged 45 to 64 years (odds ratio [OR] 2.44; 95% confidence interval [CI], 1.78-3.46) are more likely to correctly identify two or more warning signs compared with respondents without this and other characteristics [15].

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Gender: (Table 4) presents the relationship between chronic diseases patients' knowledge and their gender. It shows that there is no significant relationship at P-value (0.977) between gender and chronic diseases patients' knowledge, with weakness correlation (C.C. = 0.002). This result is supported by the study which stated that correlation between the study variables and post-test knowledge scores failed to reach significance for sex (r 5.066) [19].

Education level: (Table 4) presents the relationship between chronic diseases patients' knowledge and their education level. It shows that there is a highly significant relationship at P-value (0.000) between level of education and chronic diseases patients' knowledge with meaningful causes correlation (C.C.=0.359), mainly at the (institute) and (college-postgraduate) levels of education.

An individual with higher educational levels as a knowledge seeker will be more exposed to different ways of knowledge searching compared to a less educated individual. However, education has been found to influence health, profoundly through lifestyle behaviors. Such fact should be employed effectively.

Our finding is supported by a study which found in the univariate comparison that subjects with a higher level of education (P-value = 0.002), (P-value = 0.001) predict better knowledge about both stroke risk factors and stroke warning signs [20]. The study finding comes along with the study which found that higher educational level is a significant predictor for better knowledge of stroke warning signs and symptoms. Furthermore, the participants who have college level education are more knowledgeable on risk factors than the ones who have lower levels of education [4].

Employment: (Table 4) presents the relationship between chronic diseases patients' knowledge and their employment. It shows that there is a non-significant relationship at P-value (0.491) between employment and chronic diseases patients' knowledge with meaningless causes correlation (C.C. = 0.040).

In a cross-sectional survey among 11 German stroke support groups, it was found that being a white-collar worker was a significant predictor of good stroke knowledge [16]. In another study, it was found that those who have home-based occupations are less likely to have suitable stroke knowledge [21].

Recommendations:

1. An intensive comprehensive, evidence-based obligatory wide population-based health education programs are needed to improve awareness of stroke, especially among the most vulnerable groups (chronic diseases individuals), elderly and less educated individuals.
2. Advocacy for a change in terminology from the word "stroke" to "brain attack." to enhance the sense of urgency among both stroke risky individuals and lay people.
3. Initiate and emphasize, on children and teenagers-centered stroke health education programs to increase their awareness about such critical health issue.
4. Involving both governmental and non-governmental organizations in national health promotion programme is fundamental in order to provide the focal point for development of comprehensive health promotion services at the different levels in the society including the national, regional and district and community levels.
5. Conduction of population-based interventions aim at promoting healthy lifestyles in the community. These include reduction in salt intake, tobacco cessation, reduction in alcohol consumption, increase physical activity, controlling of excessive body weight, and reduction of the consumption of saturated fats. Consequently, a comprehensive

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intervention is necessary as it will facilitate the reduction of the risk factors of stroke effectively. The intervention must reach all segments of the population including health care settings, schools, worksites, mosques, churches, community centers, and other public health settings.

6. Further studies with a larger sample (national level) including both urban and rural populations are crucial to investigate the real level of knowledge of citizen regarding the studied phenomenon.
7. Health-oriented mass media approach should be employed by the Ministry of Health to increase population knowledge and awareness of stroke.
8. Activating community health nurses' role in Public Medical Clinics to increase chronic diseases patients' knowledge about stroke in term of its risk factors and warning signs.
9. Launch stroke national alert day in which both governmental and non-governmental organizations dedicate its efforts and resources to enhance stroke awareness among our people.

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