

Health Belief Model among Elderly People Regarding Prevention of Rheumatoid Arthritis Complication

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Abstract

Background: Rheumatoid arthritis (RA) is an autoimmune disease that develops in older adults. It causes joint pain and stiffness, **Aim of study was** to assess health belief model among elderly people regarding prevention of rheumatoid arthritis complication. **Research design:** A descriptive research design was used in carrying out this study. **Setting:** This study was conducted at Rheumatoid Arthritis Outpatient Clinic affiliated to Benha University Hospital in Benha City. **Study subjects:** A simple random sample was used in this study, including 144 elderly people. **Tools of data collection:** Two tools were used: Tool I): A structured interviewing questionnaire consisted of three parts: (a) Socio-demographic characteristics and medical history, b) knowledge about rheumatoid arthritis and c) Reported practices regarding prevention of rheumatoid arthritis complication, and Tool II): Health belief model scale. **Results:** 55.6% of the studied elderly people were male, 50.7% of them were age ranged from 60 to less than 65 years old, 43.8% of them had poor knowledge level about rheumatoid arthritis, 59.7% of them had unsatisfactory reported practices regarding RA, and 50.7% of them had poor health belief model. **Conclusion:** There were positive correlations between studied patients total knowledge score, total reported practices score and total health belief model score. **Recommendations:** Developing and implementing health educational program based on health belief model for elderly people with rheumatoid arthritis to improve and provide them with the most current information about disease, and practices about rheumatoid arthritis.

Keywords: Elderly People, Health Belief Model, Rheumatoid Arthritis

Introduction:

Ageing results from the impact of the accumulation of a wide variety of molecular and cellular damage over time. This leads to a gradual decrease in physical and mental capacity, a growing risk of disease and ultimately death. These changes are neither linear nor consistent, and they are only loosely associated with a person's age in years. The diversity seen in older age is not random. Beyond biological changes, ageing is often associated with other life transitions such as retirement, relocation to more appropriate housing and death of friends and partners (Bishak, 2022).

People worldwide are living longer. Today most people can expect to live into their sixties and beyond. Every country in the world is experiencing growth in both the size and the proportion of older persons in the population. By 2030, 1 in 6 people in the world will be aged 60 years or over. Rheumatoid arthritis affects about 24.5 million people in worldwide. This is between 0.5 and 1% of adults in the developed world with 5 and 50 per 100,000 people newly developing the condition each year (World Health Organization, 2022).

Rheumatoid Arthritis (RA) is a chronic inflammatory disorder that can affect more than just joints. In some people, the condition can damage a wide variety of body systems,

including the skin, eyes, lungs, heart and blood vessels. As autoimmune disorder, rheumatoid arthritis occurs when the immune system mistakenly attacks the own body's tissues. Unlike the wear-and-tear damage of osteoarthritis, rheumatoid arthritis affects the lining of the joints, causing a painful swelling that can eventually result in bone erosion and joint deformity (**Matteson, 2023**).

Signs and symptoms of rheumatoid arthritis may include tender, warm, swollen joints, joint stiffness that is usually worse in the mornings and after inactivity, fatigue, fever and loss of appetite. Early rheumatoid arthritis tends to affect the smaller joints first particularly the joints that attach the fingers to the hands and the toes to the feet. About 40% of people who have rheumatoid arthritis experience signs and symptoms that don't involve the joints. Areas that may be affected include skin, eyes, lungs, heart, kidneys, salivary glands, nerve tissue, and bone marrow (**Goldman, 2023**).

Elderly onset rheumatoid arthritis is an autoimmune condition that develops in older adults. It causes joint pain and stiffness. Rheumatoid arthritis is a chronic rheumatic disease, characterized by progressive articular damage and extra-articular manifestations. The global prevalence of RA between 2019 and 2022 was 460 per 100,000 population, with variations due to geographical location and study methodology. Linked data are the preferred method to estimate RA population prevalence as they provide the best case ascertainment. Women are two-to-three times more often affected than men. In 2020, 18 million people worldwide were living with rheumatoid arthritis. About 70% of people living with rheumatoid arthritis are women, and 55% are older than 55 years, 13 million people with rheumatoid arthritis experience severity

levels (moderate or severe) that could benefit from rehabilitation (**Koller, 2023**).

Health Belief Model is a tool that scientists use trying to predict health behaviors. It was originally developed in the 1950s and updated in the 1980s. The model is based on the theory that a person's willingness to change the health behaviors primarily comes from the health perceptions. According to this model, the individual beliefs about health and health conditions play a role in determining the health-related behaviors (**Wayne, 2022**).

The health belief model is more descriptive than explanatory, and does not suggest a strategy for changing health-related actions. In preventive health behaviors, early studies showed that perceived susceptibility, benefits, and barriers were consistently associated with the desired health behavior. The individual constructs are useful, depending on the health outcome of interest, but for the most effective use of the model it should be integrated with other models that account for the environmental context and suggest strategies (**Yazdanpanah & Moghadam, 2022**).

Community health nurse plays an important role regarding controlling of rheumatoid arthritis among elderly people through educating the elderly people about some precaution that should be taken to control the disease and prevent occurrence of complication as teaching elderly people self care. Also, community health nurse should give information about medication that be taken at home as dose, name, frequency and side effects, stressing on the importance of continuing to take medication even after signs and symptoms have decreased (**Belleza, 2022**).

Significance of the study:

The prevalence of rheumatoid arthritis is higher in industrialized countries, which may

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be explained by demographics such as higher average age, exposures to environmental toxins and lifestyle risk factors and under-diagnosis in low- and middle-income countries. In Egypt, the incidence rate of rheumatoid arthritis is 1-1.5% of total number of Egyptians adult approximately 0.5 million people annually, with ratio 5:1 female to male which more than world prevalence (Tamer, 2023).

Rheumatoid arthritis is one of the most important public health problems because of the effect of the disease on joints and other parts of the body including skin, eyes, lungs, hearts, nerves, and blood. Rheumatoid arthritis affected also daily activities. WHO reported that the rate of death due to rheumatoid arthritis in Egypt reached 0.02% of the total deaths (WHO, 2022).

Aim of the Study:

This study aimed to assess health belief model among elderly people regarding prevention of rheumatoid arthritis complication.

Research questions:

- 1-What are knowledge of the elderly people about rheumatoid arthritis and its complication?
- 2- What are the reported practices of elderly people with RA for prevention of complication of rheumatoid arthritis?
- 3- What is health belief model of elderly people regarding prevention of complication of rheumatoid arthritis?
- 4- Are there relations between elderly people with rheumatoid arthritis and their knowledge, reported practices and health belief model regarding rheumatoid arthritis?

Subjects & Method:

Research design:

Descriptive research design was used in carrying out this study.

Setting:

This study was conducted at Rheumatoid Arthritis Outpatient Clinic affiliated to Benha University Hospital in Benha City.

Study subjects:

A simple random sample was used in this study. Sample size 50% of all patients attended to previously mentioned setting was included 144 patients from 288 patients attended in the last year 2021. The study sample was selected according to inclusion criteria: Free from handicap, age 60 years old and above and free from complication of rheumatoid arthritis.

Tools of data collection:

Two tools were used to collect data:

Tool (I): A structured interviewing questionnaire: It was designed based on literature review of the current and past available national and international references related literature about health belief model among elderly people regarding prevention of rheumatoid arthritis complication. It was written in simple Arabic language and comprised three parts:

The first part: concerned with socio-demographic characteristics of the studied patients. It included 8 closed ended questions such as sex, age, marital status, educational level, occupation, place of residence, monthly income, and family type.

(B): It concerned with medical history of the studied patients with rheumatoid arthritis which included 8 closed ended questions.

- Past medical history: It included 6 closed ended questions such as onset of the rheumatoid arthritis diagnosed, previous hospitalized due to RA, family history of rheumatoid arthritis, complain from chronic disease and health problems, predisposing factors of rheumatoid arthritis and smoking (living with smoker, type of smoking, number of cigarette per day and date of

starting smoking.

- The current medical history: It included 2 closed ended questions such as the current signs and symptoms such as joint pain, joint swelling, deficiency or lack of joint movement and current diagnosis as rheumatoid arthritis, osteoarthritis or both together.

The second part: It concerned with knowledge of the studied patients about rheumatoid arthritis which included 8 closed ended questions such as meaning, causes, risk factors, signs & symptoms, complication, methods of diagnosis, treatment, prevention of the rheumatoid arthritis and source of knowledge.

Scoring system:

Knowledge were calculated as follows: (2) score for complete correct answer, (1) score for incomplete correct answer, and (0) score for do not know answer. For each section of knowledge, the score of questions was summed up and the total divided by the number of questions, these scores were converted into a percent score for the part. The total knowledge score = (14 points) was considered good if the score of the total knowledge was $\geq 75\%$ (≥ 10 points), while considered average if it was $50\% - <75\%$ ($7 - <10$ points), and considered poor if it was 0% or less than (7 points).

*Scoring system included all items of elderly knowledge except source of knowledge.

The third part: It concerned with reported practices of the studied patients with RA for prevention of complications of rheumatoid arthritis. It included 8 main area involving nutrition, exercise, weight management, prevention the risk of falls, rest and sleep, smoking, follow up and treatment and daily activities. It was adapted from **Allender & Rector, (2019)** which included 34 items

Scoring system:

The scoring system for elderly patients with RA for prevention RA complication reported practices were calculated as (1) score for done and (0) score for not done. The score of the items was summed up and the total divided by the number of the items for giving a mean score. These scores were converted into a percent score. The total reported practices score was 34 points and it was categorized as follows:

- Satisfactory: if the score total of reported practices was $\geq 60\%$ (≥ 20 points)
- Unsatisfactory: if the total score of reported practices was $<60\%$ (< 20 points).

Tool (II): Health belief model scale

It was adapted from **Shiyan et al., (2020)** and included (6) main items divided into (38) sub-items as the following:

- **Perceived susceptibility:** (5) questions
- **Perceived severity:** (13) questions
- **Perceived barriers:** (5) questions
- **Perceived benefits:** (7) questions
- **Cue of action:** (2) questions
- **Self-efficacy:** (4) questions

Scoring system:

The health belief model was calculated as follows: (2) score for agree response, (1) score for uncertain answer, and (0) score for disagree answer. For each section of health belief model, the score of questions was summed up and the total divided by the number of questions. These scores were converted into a percent score for the part. The total health belief model score was (72) points and it was categorized as follows:

- Good: if the score of the total health belief model was $\geq 75\%$ (≥ 54 points)
- Average: if it was $50\% - <75\%$ ($36 - <54$ points)
- Poor: if it was $<50\%$ or less (< 36 points).

Administrative design:

An official letter was obtained from

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Dean of Faculty of Nursing Benha University to Director of Benha University Hospital to obtain the approval for data collection. The objective and the nature of the study were explained and then it was possible to carry out the study. The researcher interviewed each study participant, and obtained an informed consent before starting the data collection. The time of data collection was also determined based on their view to gain their approval and cooperation.

Content validity:

The content validity of the tools was done by five Experts of the Faculty Staff from the Community Health Nursing Specialties, who reviewed the tools for clarity, relevance, comprehensiveness and applicability and give their opinions.

Reliability of tools:

Reliability of the tools was applied by the researcher for testing the internal consistency of the tool, by administration of the same tool to the same subject under similar condition on one or more occasion. The reliability of the tools was done by Cornbrash's Alpha Coefficient test which revealed that each of the two tools consisted of relativity homogenous items as indicated by the moderate to high reliability of each tool. The internal consistency of knowledge was = 0.732, reported practices=0.81 and health belief model=0.741.

Ethical considerations:

A written approval was obtained from the Scientific Research Ethical Committee at the Faculty of Nursing/ Benha University. All ethical issues were assured; oral consent has been obtained from each patient with RA before conducting the interview and the researcher gave a brief orientation to the purpose of the study. They were also reassured that all information gathered would

be confidential and used only for the purpose of the study. No names were required on the forms to ensure anonymity and confidentiality. They were also informed about the right to withdraw at any time from the study without giving any reason.

Pilot study:

A pilot study was conducted on 10% of the total sample (14 patients) to test the clarity, feasibility and applicability of tools using the interviewing questionnaires. Based on pilot study, the modification of the tools included rephrasing, rearrangement of some questions. The pilot study was carried through two weeks before starting the study and no modification were done, so the pilot study sample was included in the total sample.

Field work:

Data were collected through a period of 6 months, from the beginning of May 2022 until the end of October 2022. The researcher visited the Out-Patient Clinic of Rheumatoid Arthritis at Benha University Hospital three days per week because these days Out-Patient clinic of rheumatoid arthritis were opened (Saturday, Tuesday and Thursday) from 9 A.M. to 2 P.M, to collect data from patients until sample size was completed. The researcher introduced herself, greeted patients and explained the purpose of the study to each patient to gain confidence and cooperation. A written consent was taken from each patient to participate in the study.

A self-Administrated questionnaire was distributed for patients to obtain patients' socio-demographic data and patients' knowledge regarding rheumatoid arthritis. The average numbers of interviewing patient were between 1-2 patient per day depending on their response to the interviewer. Each patient took about 20-30 minutes to fill the

tools depending on their understanding and response. The researcher checked each filled questionnaire to ensure its completion.

Statistical analysis:

The collected data were organized, tabulated and analyzed by using electronic computer and statistical analysis was done by using Statistical Package for Social Sciences (SPSS,) version (22). Characteristics of the studied patients were presented in term of number and percentage, frequency, and mean & standard deviation. Qualitative variables were compared using qui-square test (χ^2) as the test of significance.

Statistical significance is considered as:

- Highly significant when p-value < 0.001.
- Significant when p-value < 0.05.
- No significant when p-value > 0.05.

Results:

Table (1): Shows that, 55.6% of the studied patients were male, 50.7% of the studied patients' age ranged from 60 to less than 65 years old, with mean \pm SD 64.21 ± 7.32 , 57.6% of the studied patients were married and 45.1% of the studied patients had basic education. Also, 52.1% of the studied elderly people were worked, 59.7% of them were lived in urban areas, 56.3% of the studied patients had enough monthly income and save, and 43.1% of the studied elderly people had lived alone.

Figure (1): Illustrates that, 45.8% of the studied patients had average knowledge level about rheumatoid arthritis, 43.8% of them had poor knowledge level about RA, and 10.4% of them had good knowledge level about rheumatoid arthritis.

Figure (2): Illustrates that, 59.7% of studied patients had unsatisfactory reported practices regarding rheumatoid arthritis, while 40.3% of studied patients had satisfactory reported practices regarding

rheumatoid arthritis.

Figure (3): Illustrates that, 50.7% of the studied patients had poor health belief model about prevention of rheumatoid arthritis complication, while 33.3% of the studied patients had average health belief model about prevention of rheumatoid arthritis complication, and only 16.0% of the studied patients had good health belief model about prevention of rheumatoid arthritis complication.

Table (2): Reveals that, there were positive correlations between the studied patients' total knowledge score, total reported practices score and total health belief model score.

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Table (I): Frequency distribution of the studied patients regarding their socio-demographic characteristics (n=144).

Socio-demographic characteristics	No.	%
Sex		
Male	80	55.6
Female	64	44.4
Age/years		
60-<65	73	50.7
65-<70	54	37.5
70-≥75	17	11.8
Mean ±SD	64.21 ± 7.32	
Marital status		
Married	83	57.6
Divorced	20	13.9
Widower	41	28.5
Educational level		
Can't read and write	47	32.6
Basic education	65	45.1
Secondary education	29	20.1
University education	3	2.2
Occupation		
Work(freelance)	75	52.1
On retirement	69	47.9
Place of residence		
Urban	86	59.7
Rural	58	40.3
Monthly income		
Enough and save	81	56.3
Enough	56	38.8
Inadequate	7	4.9
Family type		
Alone	62	43.1
Nuclear family	51	35.4
Extended family	31	21.5

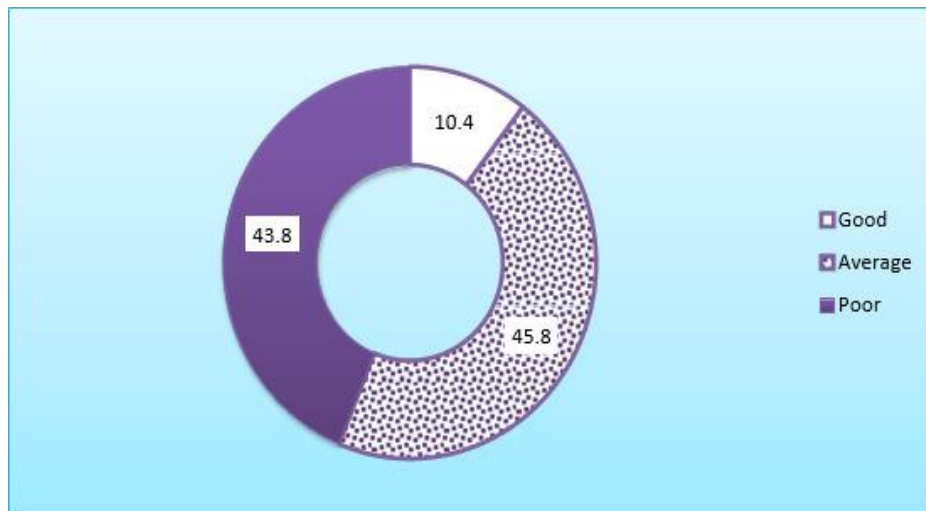


Figure (1): Percentage distribution of the studied patients' total knowledge level regarding rheumatoid arthritis (n=144).

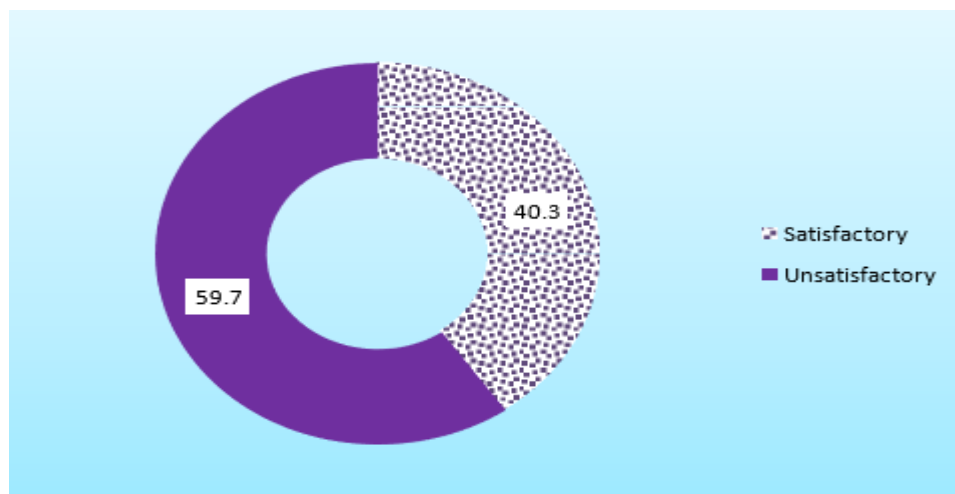


Figure (2): Percentage distribution of the studied patients' total reported practices level about prevention of rheumatoid arthritis complication (n=144).

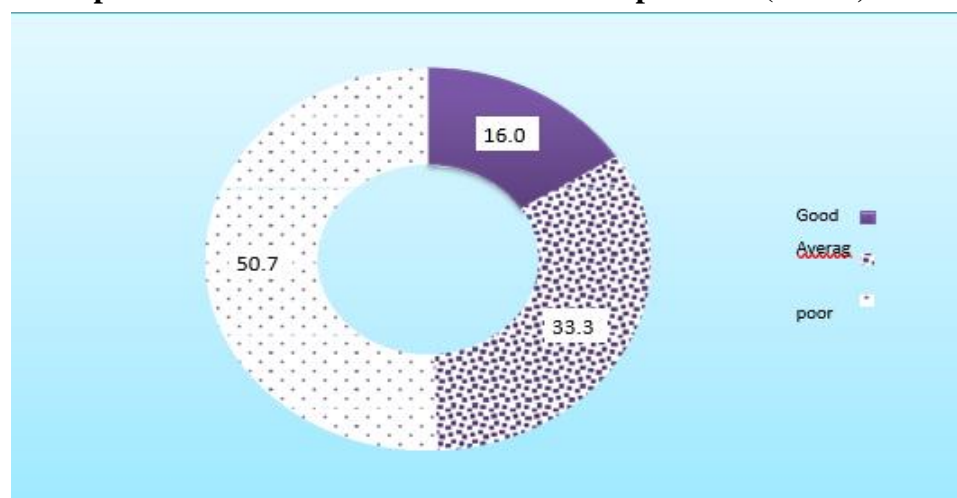


Figure (3): Percentage distribution of the studied patients regarding their total health belief level about prevention of RA complication (n=144).

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Table (2): Correlation between total knowledge score, total reported practices score and total health belief model score.

		Total knowledge	Total practices	Total health belief model score
Total knowledge	r	1	.753	.129
	p-value		.026*	.123
	n	144	144	144
Total reported practices	r	.753	1	.972
	p-value	.026*		.003*
	n	144	144	144
Total healthbelief model score	r	.129	.972	1
	p-value	.123	.003*	
	n	144	144	144

***Statistical significance p=<0.05%**

Discussion:

Rheumatoid arthritis is a systemic autoimmune disease primarily affecting synovial tissue, leading to joint destruction and disability. The elderly patients with RA consists of patients with onset of RA after age 60 and elderly patients who presented with young onset RA earlier in life. The elderly RA populations expanding, mainly due to population aging with increased life expectancy and to an increasing incidence of elderly onset rheumatoid arthritis (May & Lina, 2022).

Regarding the socio-demographic characteristics of the studied elderly people with rheumatoid arthritis, the present study revealed that, more than half of the elderly people were male. This finding is in agreement with Anne et al., (2019) who clarified in a study carried out on older adults diabetes associated with musculoskeletal pain, osteoarthritis and rheumatoid arthritis in Denmark n=162.283, and reported that 51.8% of the studied subject were male.

As regarding to age, the present study revealed that, more than half of the elderly

people age ranged from 60 to less than 65 years old, with mean ± SD 64.21±7.32. This finding is in agreement with Safiri et al., (2019), who clarified that global, regional and national burden of rheumatoid arthritis 1990–2017: asystemic analysis of the global burden of disease study in England n=440, and reported that 57.6% of the studied subjects were aged from 60 to less than 65years old. This might be due to elderly people high risk to chronic diseases as rheumatoid arthritis.

Regarding total knowledge of the studied elderly people about RA, the present study showed that, more than two fifths of the studied elderly people had poor knowledge level about rheumatoid arthritis. This finding is in agreement with Ahmed et al., (2020) who reported that, 48.4% of the studied subjects had poor knowledge level of rheumatoid arthritis. This might due to nearly half of them had basic education.

Regarding total reported practices of the studied elderly people, the present study showed that, more than two fifths of them had satisfactory reported practices regarding rheumatoid arthritis. This finding is in agreement with Marie et al., (2018), who

clarified that efficacy and safety of tocilizumabin in elderly patients with rheumatoid arthritis in French n=222, and reported that 44.5% had satisfactory practices regarding rheumatoid arthritis.

Regarding total health belief model of the studied elderly people, the present study showed that, half of the studied elderly people had poor health belief model. This finding is in the same line with **Wandabwa, (2021)**, who studied knowledge, health beliefs, and attitudes of osteoporosis as complication of rheumatoid arthritis in women aged 18-52 years and who reported that 54.3% of the studied subjects had low health beliefs.

Regarding correlation between total knowledge score, reported practices score and total health belief model score among studied elderly people, the present study revealed that there were positive correlations between total knowledge score, total reported practices score and total health belief model score of the elderly people with RA. These findings disagree with **Wandabwa, (2021)**, who reported that there were no significant between total knowledge score, total attitude score and total health belief model score.

Conclusion:

The study showed that approximately two fifths of the studied elderly people had poor, and average knowledge level about rheumatoid arthritis, and only tenth of them had good knowledge about rheumatoid arthritis. Slightly less than three fifths of the studied elderly people had unsatisfactory reported practices level regarding rheumatoid arthritis, and two fifths of them had satisfactory reported practices level regarding rheumatoid arthritis. Also, half of the studied elderly people had poor health belief model, one third of them had average health belief model, and less than one fifth had good health belief model about prevention of rheumatoid arthritis complication. Moreover, there were

positive correlations between the studied elderly people total knowledge score, total reported practices score and total health belief model score.

Recommendations:

- Developing and implementing health educational program based on health belief model for elderly people with rheumatoid arthritis to improve and provide them with the most current information about disease, and practices about rheumatoid arthritis.
- Booklets should be available and distributed to each elderly people with rheumatoid arthritis disease.
- Further research studies about rheumatoid arthritis needed to be carried out with different large samples in different health care settings.

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نموذج المعتقد الصحي لدى كبار السن تجاه الوقاية من مضاعفات التهاب المفاصل الروماتويدي

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التهاب المفاصل الروماتويدي هو أحد أمراض المناعة الذاتية التي تؤثر على النسيج الزليلي و يسبب آلام المفاصل وتيبسها. هدفت هذه دراسة الي تقييم نموذج المعتقد الصحي لدى كبار السن تجاه الوقاية من مضاعفات التهاب المفاصل الروماتويدي. و تم استخدام التصميم الوصفي لإجراء هذه الدراسة. حيث تم اجراء هذه الدراسة في العيادات الخارجية لالتهاب المفاصل الروماتويدي في مستشفى بنها الجامعي على عينة عشوائية بسيطة في هذه الدراسة (144) مريضاً. و تم استخدام أداتين لجمع البيانات: (1) استبيان منظم لإجراء المقابلات والذي يتكون من ثلاثة أجزاء: أ- الخصائص الديمغرافية والتاريخ المرضي، ب- المعلومات عن التهاب المفاصل الروماتويدي و ج- الممارسات المبلغ عنها للوقاية من مضاعفات التهاب المفاصل الروماتويدي و(2) مقياس نموذج المعتقد الصحي. وظهرت النتائج ان 55.6% من كبار السن الذين شملتهم الدراسة كانوا من الذكور، 50.7% منهم تتراوح أعمارهم بين 60 إلى أقل من 65 سنة، 43.8% منهم لديهم مستوى معلومات ضعيف حول التهاب المفاصل الروماتويدي، 59.7% منهم لديهم ممارسات غير مرضية فيما يتعلق بالتهاب المفاصل الروماتويدي، و 50.7% منهم لديهم نموذج اعتقاد صحي سيئ. و كانت هناك ارتباطات إيجابية بين مجموع درجات المعلومات لدى المرضى الذين شملتهم الدراسة، ومجموع درجات الممارسات المبلغ عنها، ومجموع نقاط نموذج المعتقد الصحي. واوصت الدراسة بتطوير وتنفيذ برنامج تثقيفي صحي يعتمد على نموذج المعتقد الصحي لكبار السن المصابين بالتهاب المفاصل الروماتويدي لتحسين وتزويدهم بأحدث المعلومات حول المرض والممارسات المتعلقة بالتهاب المفاصل الروماتويدي