SELF-CARE MANAGEMENT AMONG PATIENTS WITH EXTERNAL FIXATORS

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Abstract

Background: The current preferred method for treating open fractures is the use of external fixator systems, which are considered the most effective due to their ability to provide adequate soft tissue coverage and ensure stable internal fixation. Aim: The study aimed to assess self-care management among patients with external fixators. **Design:** This study employed a descriptive research methodology. Setting: This study was done in orthopedic departments and orthopedic outpatient clinics at Main Mansoura University Hospital and Emergency Hospital. Sampling: A sample of 66 patients with an external fixator was selected purposefully. Tools: Two tools were utilized in this study to collect pertinent data. Tool I was the structure interview questionnaire sheet, and Tool II was the patient's self-care practice checklist (reported practice). Results: A total of 84.8% of the participants' knowledge regarding the first knowledge domain (patients' knowledge about an external fixator) was unsatisfactory. Moreover, 97% of the participants had an unsatisfactory knowledge level about the second knowledge domain (patients' information about self-care activities). About 57.6% of the participants had an unsatisfactory practices regarding wound-pin site care. Furthermore, 87.9% and 93.9% of the studied patients had unsatisfactory practice concerning neurovascular assessment and the performance of isometric exercises, respectively. Conclusion: The entire group had unsatisfactory knowledge level about self-care activities for external fixation. In addition, the entire group had unsatisfactory practices about self-care activities for external fixation. Recommendations: It is imperative for educational and training programs to be meticulously designed in order to assist patients undergoing external fixation in acquiring and enhancing their understanding and implementation of self-care strategies regarding external fixations

Index Terms: Self-Care Management, Patients, External Fixator.

INTRODUCTION

A bone fracture is a form of musculoskeletal disorder that leads to further harm to the soft tissue encompassing the fractured area. A fracture refers to a disruption or discontinuity in the structural integrity of the bone. Each year, over 1.3 million individuals succumb to fatalities resulting from traffic accidents. ¹These accidents serve as the primary cause of fractures and the leading cause of death among individuals aged 15 to 29.

In order for a fracture to properly heal, it necessitates immobilization through the utilization of casts, braces, splints, immobilizers, or internal and external fixation devices.²

External fixators (EF) play a crucial role in addressing trauma emergencies. They serve as a temporary solution for managing intricate open fractures, fractures accompanied by burns, severe comminuted diaphyseal fractures, challenging joint fractures, certain pediatric fractures, and significant ligamentous injuries. ^{3, 4}

Additionally, EF are employed when waiting for the patient's soft tissue injuries to heal is necessary before providing definitive fracture treatment, in cases where the surgical team with the required expertise is not readily available, or when the patient needs to be transferred to a referral center.⁵

There are various subtypes of EF, such as bilateral, unilateral, multiplanar, unilateral, and circular fixators (Ilizarov fixators). Among these, the Ilizarov fixator stands out as the most commonly utilized circular fixator. ⁶ It is important to acknowledge the potential risks that patients may face when using EF. These risks encompass pin site infection, prolonged hospital stay, pain, and hindered fracture healing.⁷

Sherman provides a comprehensive definition of self-care as the voluntary actions that individuals undertake to improve their overall wellbeing and health. Self-care encompasses the personal capacity to attend to one's own needs and engage in activities that support optimal health. It involves the efforts made by individuals or communities to attain, sustain, or enhance their overall well-being.⁸

The outcomes of self-care are multifaceted and include the achievement of desired outcomes, reduced risk of complications, decreased reliance on healthcare services such as hospitals and outpatient clinics, increased patient satisfaction, lower healthcare costs, improved coping abilities, enhanced sense of control, heightened sense of significance, well-being, and self-expression, as well as improved recovery from medical procedures or illnesses.⁹

Self-care management (SCM) has become a prevalent concept in health education and is associated with various health promotion and patient education initiatives. What sets SCM apart from traditional programs is its emphasis on self-tailoring and the utilization of self-management abilities and expertise, which are applied to oneself as deemed suitable.¹⁰

In order to facilitate patients in enhancing their health status, the SCM approach encompasses several techniques such as problem-solving, action planning, self-awareness, adaptability skills, management of stress, sharing of experiences, coaching, confidence-building, motivation, and positive feedback.¹¹

Aim of the Study

This study aimed to evaluate self-care management among participants with external fixators.

Research Questions

- Q1. What is patients' knowledge of self-care activities regarding external fixators?
- Q2. What is patients' practice of self-care activities regarding external fixators?
- Q3. Is there a relation between patients' knowledge regarding self-care activities and their socio-demographic data and their clinical data?
- Q3. Is there a relation between patients' self-care practices and their socio-demographic data and their clinical data?

Operational Definitions

Self-care Management

In this research, SCM refers to the patient's knowledge of self-care activities regarding external fixation and the patient's performance of activities related to self-care, such as pin site care, performing isometric exercises, and assessing the neurovascular integrity of the affected limb.

METHODS

Design

The design of this study was descriptive to assess the SCM of the target population.

Setting

The research was done in the orthopedic departments and orthopedic outpatient clinics at Main Mansoura University Hospital and Emergency Hospital, Egypt.

Participants

The research comprised 66 adults who were included in a purposeful sample. For this study, the patients were selected from the previously mentioned environment depending on specific criteria:

Inclusion Criteria: adults between the ages of 20 and 60, of any gender, utilizing any type of EF device, who expressed a willingness to participate and possessed the ability to communicate effectively.

Exclusion Criteria: patients with comorbid conditions such as diabetic mellitus, changes in consciousness or mental disorders

Sample Size: based on information found in the literature, ¹² The sample size can be determined using the following formula; using Open Epi software/calculating sample size, it was 93.3% with an alpha error of 5% (significance 95.0%) and β error (20%), i.e., a study power of 80%.

Then the estimated sample size is 58 patients; we can include 15% for improved data quality and for dropouts. Therefore, the total number was 66 patients.

Tools of Data Collection

The study data was gathered through using two tools:

Tool I: Structure Interview Questionnaire Sheet

The researcher evolved this sheet in English and translated it into simple Arabic after reviewing the pertinent literature. ^{1, 13} this sheet consisted of 37 questions, divided into two parts:

Part 1: Socio-demographic and clinical information of the patient under study included 11 questions such as age, gender, marital status, educational level, residence location, work, smoking, living situation, EF type, EF site, and clinical diagnosis.

Part 2: Patients' self-care knowledge regarding the external fixation included 26 multiplechoice questions. Part 2 was divided into two domains; the first domain was concerned with patients' knowledge about an EF (seven questions: definition, types, indications, advantages and disadvantages, complications, and related warning signs and symptoms).

The second domain was concerned with patients' information about self-care activities (19 questions about range-of-motion exercises, neurovascular evaluation, and pin site care).

Scoring System

Every correct answer took one degree, while the wrong answer took zero. The scores of the questions were summed up, and the total score was then turned into a percentage and categorized as follows: equal to or more than 70% was considered satisfactory, while less than 70% was an unsatisfactory level of knowledge.

Tool II: Patient's Self-Care Practice Checklist (Reported Practice) was used to evaluate the manner in which patients practice in relation to most aspects of EF care. This tool was adapted from Khorais et al. (2018), and Perry, Potter, and Desmarais (2015) ^{13, 14} to evaluate the practices of patients.

It contained three procedures; the first procedure was wound/pin site care. The second procedure was the assessment of the neurovascular integrity sheet, and the third procedure was performing isometric exercises.

Scoring System

There was a choice to mark the checklist elements as "done" or "not done," reflecting if the practice was carried out correctly. Each done step received one grade, whereas the step that was not done received zero.

The total level of patients' the practice was divided into the following categories: equal or more than 70% was taken into consideration satisfactory level of practice. Less than 70% was taken into consideration an unsatisfactory level of practice.

Validity

The research tools were tested for validity by a commission composed of five experts, two from the Faculty of Nursing's critical care nursing department and three from the department of medical-surgical nursing, Mansoura University). They analyzed the tools for purity, importance, inclusiveness, applicability, and simplicity. Some adjustments were performed related to their propositions and commentaries.

Reliability

The Cronbach's alpha test was used to test the questionnaires, and the results demonstrated good reliability, which was 0.916 and 0.920 for Tool 1, Part 2, and Tool II, respectively.

Pilot Study

The research was done on seven patients. To ensure the clarity of the tool and its applicability, a random selection process was used to choose patients from the orthopedic department. Modifications were implemented in response to the pilot study's results. The selected group of patients had been excluded from the study.

Ethical Considerations

The research was authorized by the Research Ethics Committee, Faculty of Nursing at Mansoura University, Egypt. A verbal informed consent was obtained from the studied patients before starting data collection. The confidentiality of the collected data was emphasized while giving the patient the choice to accept or refuse to be included in the study, and they were made aware of their freedom to exit the research at any time without needing to provide justification.

Data Collection

The current data was gathered from January 2023 to July 2023, a span of seven months. The researchers met the patients who met the study criteria in the postoperative phase at the above-mentioned hospital after obtaining permission to conduct the current study. Then, before collecting any data, the researcher gave an introduction to the patients, explained the purpose of the study, and obtained consent from them. In the orthopedic departments, data was gathered on Saturdays, Sundays, Tuesdays, and Wednesdays of each week. The researcher evaluated the socio-demographic and clinical information of the patients by using Tool I, Part 1, and the patients' knowledge regarding EF self-care activities by using Tool I, Part 2, at orthopedic departments. While the patient's self-care practices were evaluated using Tool II, based on the patients' performance at home when the patients came to the orthopedic outpatient clinics (routine patient follow-up after two weeks of discharge), the duration of the interview with each patient was 20 to 30 minutes.

Statistical Analysis

IBM-SPSS software, version 20.0, was used to enter and analyze the data. (Armonk, NY: IBM Corp.) Numbers and percents were used to describe the qualitative data. The normality

of the distribution was confirmed using the Kolmogorov-Smirnov test. Standard deviation, mean, and range (minimum and maximum) were used to describe quantitative data. The results' significance was determined at the 5% level. To compare the two categories under study, student t-tests for normally distributed quantitative data were used. For comparing normally distributed quantitative variables between two studied groups, use the Student t-test; to compare normally distributed quantitative variables between more than two groups, use the F-test (ANOVA).

RESULT

Characteristic	No.	%
Age (years)		
20-30	36	54.6
41-50	14	21.2
31-40	9	13.6
51-60	7	10.6
Gender		
Men	49	74.2
Woman	17	25.8
Educational level		
Illiterate	16	24.3
Primary	8	12.1
Preparatory	13	19.7
Secondary	20	30.3
University	9	13.6
Occupation		
Working	46	69.7
Not working	20	30.3
Smoking		
Smoker	26	39.4
Non smoker	40	60.6
Marital status		
Married	33	50.0
Single	30	45.5
Divorced	3	4.5
Residence		
Rural	26	39.4
Urban	40	60.6
Living status		
Live alone	4	6.1
Live with family	49	74.2
Live with spouse	13	19.7

Table 1: Socio-Demographic Characteristics of the Studied Patients (N=66)

Table (1): Regarding socio-demographic characteristics, it was noted that 54.6% of the patients under study ranged in age from 20 to 30 years, and most of them were men (74.2%). As regards educational level, 30.3% of them had a secondary certificate, and 69.7% of

the studied patients had an active work status. In relation to smoking habits, 60.6% of the studied patients were non-smokers, and 50.0% of them were married. About 60.6% of the patients in the study were residents of urban areas, and 74.2% of them were living with family.

Clinical data	No.	%
Clinical diagnosis		
Open Fracture grade I	33	50.0
Open Fracture grade II	11	16.7
Deformity	13	19.7
Limb lengthening	9	13.6
Type of external fixator		
Illizarov	24	36.4
Uni-lateral	14	21.2
Bi-lateral	27	40.9
Illizarov and Bi-lateral	1	1.5
Site of external fixator		
Upper extremities	13	19.7
Lower extremities	53	80.3

Table (2): According to this table, 50.0% of the patients in study had an open fracture grade I. Regarding the type of external fixator, 40.9% of them had the bilateral external fixator, and 80.3% of them had lower limb fixation.



Figure 1: Distribution of the Studied Patients According to their Knowledge Domains and Total Knowledge Score (N=66)

Figure 1: This figure indicates that 84.8% of the subjects in the research had an unsatisfactory level of knowledge in relation to the first knowledge domain (patients' knowledge about an external fixator). Moreover, 97.0% of the participants reported an unsatisfactory knowledge level regarding the second knowledge domain (patients'



information about self-care activities). The overall knowledge level of all the patients under study (100%) was considered unsatisfactory.

Figure 2: Distribution of the Studied Patients According to their Self-Care Practices (N=66)

Figure 2: This graph indicates that 57.6% of the participants had unsatisfactory practices regarding wound-pin site care. Moreover, 87.9% and 93.9% of the participants had unsatisfactory practices concerning neurovascular assessment and the performance of isometric exercises, respectively. The entire population of patients under the study (100%) had unsatisfactory overall practices.

			% Score for overall knowledge	Test of Ois	Р
3	Socio-demographic N		Mean ± SD.	lest of Sig.	
Age	e (years)				
•	20-30	36	31.73 ± 14.28		
•	41-50	14	36.81 ± 11.66	F=	0.004*
•	31-40	9	22.22 ± 7.39	4.820	0.004
•	51-60	7	18.13 ± 8.80	1	
Ger	nder				
•	Men	49	30.85 ± 14.53	t=	0.426
•	Woman	17	27.83 ± 10.75	0.784	0.430
Edι	ucation level				
•	Illiterate	16	18.03 ± 6.39		
•	Primary	8	29.33 ± 10.47		
•	Preparatory	13	24.26 ± 8.37	F=	<0.001*
•	Secondary	20	36.73 ± 14.03	14.3.9	
٠	University	9	45.73 ± 5.91	1	

Table 3: Relation between Patients' Overall Knowledge and their
Socio-Demographic Characteristics (N = 66)

Occupa	ation				
• V	Vorking	46	28.76 ± 14.86	t=	0.044
• N	lot working	20	33.08 ± 10.01	1.184	0.241
Smokin	g				
• 5	Smoker	26	24.85 ± 9.92	t=	0.006*
• N	lon smoker	40	33.46 ± 14.73	2.836	0.000
Marital	status				
• N	larried	33	25.87 ± 12.02	F	
• 5	Single	30	33.85 ± 14.26	Γ= 2,522	0.035*
• C	Divorced	3	38.46 ± 13.32	3.555	
Reside	nce				
• F	Rural	26	34.02 ± 13.22	t=	0.057
• L	Irban	40	27.50 ± 13.45	1.938	0.057
Living s	status				
• L	ive alone	4	30.77 ± 15.70		
• L	ive with family	49	28.81 ± 13.67	Г= 0.025	0.398
• L	ive with spouse	13	34.62 ± 13.04	0.935	
SD: Sta	ndard deviation	F:	F for One-way ANOVA test t: Stude	ent t-test	
p: p valu	ue for comparison b	etweer	n the studied categories		
*: Statis	tically significant at	p ≤ 0.0	95		

Table 3: In this table, there was a statistically significant relation between patients' age and their overall knowledge score (p = 0.004). Furthermore, a statistically significant relation (p<0.001) was found between the educational level of patients and their overall knowledge. Moreover, both smoking habits and marital status were significantly related to patients' overall knowledge score (p = 0.006 and p = 0.035, respectively).

Table 4: Relation between Patients' Overall Knowledge Score and their
Clinical Data (N = 66)

Clinical data		% Score for overall knowledge	Test of	Р	
Cirrical data	IN	Mean ± SD.	Sig.	F	
Clinical diagnosis					
Open Fracture grade I	33	27.62 ± 14.94			
Open Fracture grade II	11	25.87 ± 11.93	F=	0.025*	
Deformity	13	31.66 ± 9.70	3.331	0.025	
Limb lengthening	9	41.88 ± 9.51			
Type of external fixator					
Illizarov	24	34.62 ± 10.02			
Uni-lateral	14	21.43 ± 7.03	F=	0.021*	
Bi-lateral	27	30.77 ± 17.03	3.158	0.031	
Illizarov and Bi-lateral	1	23.08			
Site of external fixator					
Upper extremities	13	25.0 ± 15.54	t=	0.642	
Lower extremities	53	30.77 ± 17.76	0.489	0.643	
SD = Standard deviation. F: F for One-way ANOVA test t: Student t-test					
p: p value for comparison betw	/een	the studied categories			
*: Statistically significant at p ≤	0.0	5			

Table 4: The clinical diagnosis of studied patients and their total knowledge score had a statistically significant relation (p = 0.025). Furthermore, a statistically significant relation (p = 0.031) was observed between the type of external fixator and the patients' overall knowledge score.

Socio-demographic	N	% Score for overall Practice	Test of Sig	Р		
Socio-demographic		Mean ± SD.	rest of org.			
Age (years)						
· 20-30	36	46.71 ± 11.83	F=			
· 41-50	14	37.35 ± 16.39	1.409	0.040		
· 31-40	9	43.75 ± 12.98		0.249		
· 51-60	7	46.97 ± 11.04				
Gender						
• Men	49	44.39 ± 12.56	t=	0.64		
• Woman	17	46.10 ± 13.78	0.47	0.04		
Education level						
Illiterate	16	42.80 ± 12.55	F=			
 Primary 	8	41.97 ± 12.88	0.968			
 Preparatory 	13	47.17 ± 14.56		0.432		
Secondary	20	43.18 ± 10.60				
University	9	51.31 ± 15.05				
Occupation						
Working	46	44.49 ± 12.54	t=	0.740		
Not working	20	45.63 ± 13.69	0.329	0.743		
Smoking						
Smoker	26	42.96 ± 14.36	t=	0.242		
Non smoker	40	46.05 ± 11.71	0.957	0.342		
Marital status						
Married	33	45.68 ± 12.63	F=			
Single	30	44.85 ± 13.43	0.88	0.42		
Divorced	3	35.42 ± 3.87				
Residence						
Rural	26	46.18 ±12.82	t=	0.405		
• Urban	40	43.96 ± 12.87	0.686	0.495		
Living status						
Live alone	4	45.31 ± 13.62	F=			
 Live with family 	49	43.97 ± 12.67	0.49	0.615		
Live with spouse	13	47.94 ± 13.62				
SD = Standard deviation. F: One-way ANOVA test t: Student t-test						
p: p value for comparisor	n betw	een the studied categories				
*: Statistically significant at p ≤ 0.05						

Table 5: Relation	between	Patients'	Overall	Practice	Score	and
Th	eir Socio-	-Demogra	phic (N	= 66)		

Table 5: There was no statistically significant relation between patients' sociodemographic characteristics and their overall practice score (p > 0.05).

Table 6: Relation between Patients' Overall Practice Score andTheir Clinical Data (N = 66)

		% Score for overall Practice	Test of Sig		
Clinical data	IN	Mean ± SD.	Test of Sig.	P	
Clinical diagnosis					
Open fracture grade I	33	42.52 ± 11.47			
Open fracture grade II	11	46.46 ± 11.32	F=	0.201	
Deformity	13	45.33 ± 15.46	1.040	0.301	
Limb lengthening	9	50.62 ± 14.94			
Type of external fixator					
Illizarov	24	48.48 ± 13.48			
Uni-lateral	14	45.86 ± 10.43	F=	0.217	
Bi-lateral	27	41.38 ± 12.90	1.524	0.217	
Illizarov and bi-lateral	1	36.11			
Site of external fixator					
Upper extremities	13	49.15 ± 10.74	t=	0.177	
Lower extremities	53	43.78 ± 13.13	1.364	0.177	
SD = Standard deviation. F: One-way ANOVA test t:Student t-test					
p: for comparison between the studied categories					
*: Statistically significant a	it p ≤	0.05			

Table 6: There was no statistically significant relation between patients' clinical data and their overall practice score (p > 0.05).

DISCUSSION

External fixation offers a straightforward, secure, and efficient method of treatment, which surpasses the stability provided by gypsum powder (plaster) fixation. The study findings revealed that the age of more than half of the study participants ranged from 20 to 30 years. This is in harmony with the study of Sayed, Mohammed, Mostafa, and Desouky (2019), which studied the "Effect of Nursing Management on Pin Site Infection among Incidence Patients with External Fixators" and showed that about half of their patients under study were aged between the ages of 18 and fewer than 30. ¹⁰ On the contrary, Badr, Mohammed, EL-Shenawie, and Shehata (2021), who studied the "Effect of Safety Measures Educational Protocol on the Incidence of Infection, Satisfaction, and Anxiety Level among Orthopedic Patients with External Fixation," Based on their results, the majority of the study group was aged from 30 to less than 40 years' old. ¹¹

Regarding patients' gender, nearly three-fourths of the studied patients were men. From the perspective of the researcher, this might be because men are more likely than women to rush behaviors, which leads to more risk for accidents and fractures than females due to frequent exposure to the street and a high level of activity-related injuries such as motorcycles. This comes in agreement with the study of Morsy, Sheta, and Mohamed (2021), which carried out a study about the effectiveness of nursing protocols for self-care techniques for patients with EF and mentioned that the majority of their studied patients were men. ⁶ Conversely, this contradicts the findings of Xing et al. (2020), whose research

aimed to explore the determinants of self-care agency among outpatients with EF assistance, revealing that more than half of the participants were women.⁹

In reference to patients' occupations, in this study, it was found that above two-thirds of the study participants' were working. This result is highly like to the results of both Badr et al. (2021) and Morsy et al., (2021) who showed that more than half of their studied patients were employed. ^{6, 11} in respect to smoking habits, in the current study, less than two-thirds of the studied patients were non-smokers. The current research outcomes are consistent with the results reported by Sayed et al. (2019), indicating that most of the individuals included in their study were not smokers. ¹⁰ But in contrast, the result of a study carried out by Mert, Bozgeyik, and Tekin (2022) revealed that more than half of their patients were smokers. ¹⁵

As for level of education, in the present study, less than one-third of the study group had secondary education. The present finding shows that more people are realizing how important education is in our society. This conclusion is reinforced by Emara, Attia, and Bahgat (2023), who conducted a study titled "Extremities, Fractures, and Fixation and Their Effects on Patients, Quality of Life" and showed that more than one-third of patients had secondary education. ¹⁶ In contrast with this finding, the study conducted by Khorais, Ebraheim, and Barakat (2018) aimed to investigate how self-care practices influenced the overall well-being and contentment of individuals with EF and showed that nearly one-third of the study participants were unable to read or write. ¹³

In the present study, half of the study participants were married. The current finding is similar to the findings of Morsy et al. (2021), who noted that the most of their patients were married. ⁶ In the current study, less than two-thirds of studied patients lived in urban areas, and less than three-fourths of them were living with their families. This study finding is similar to a study done by Abu EI-Kass, Ragheb, Ali, and Hamed (2022). ¹⁷ They revealed that all patients in both groups were residents of urban areas, and those participants lived with their families. Oppositely, the present study' result disagrees with Morsy et al. (2021), who clarified that more than half of their studied participants resided in rural areas. ⁶

In relation to the clinical diagnosis, half of the studied patients had an open fracture grade I. These findings were supported by the study of Shukurov et al., (2020), who stated that the most common injuries in fracture patients were type I. ¹⁸ conversely, this conclusion disagrees with Abouelala et al., (2023) who revealed that the highest percentage of patients had an open grade II fracture. ¹

Concerning the type of EF, bilateral EF represented two-fifths of the studied patients. These findings disagree with a study by Abouelala et al., (2023) who showed that all of the studied subjects used the Illizarov fixator. ¹ In relation to the site of EF application in this study, it was found that the most of the patients studied had fixators in their lower extremities. These study findings agree with results obtained by Badr et al., (2021) who

revealed that the highest percentage of their patients had fixators in their lower extremities.¹¹

In this study, the majority of the studied patients had an unsatisfactory level of knowledge regarding the first knowledge domain (patients' knowledge about an external fixator). Moreover, most of them had an unsatisfactory knowledge level regarding the second knowledge domain (patients' information about self-care activities). The entire population of patients had an unsatisfactory overall knowledge level.

The present study finding is similar to Abouelala et al.'s findings; the highest percentage of their groups had unsatisfactory knowledge in the pre-implementation phase. ¹ Moreover, these findings agree with the study done by Morsy et al. (2021), which showed that at the pre-implementation of health educational guidelines, the majority of the studied patients had an unsatisfactory overall knowledge level about the skeletal system, fracture, orthopedic fixator, and self-care. ⁶

The present study showed that more than half of the studied patients had unsatisfactory practices regarding wound-pin site care. Moreover, the majority of the studied patients had unsatisfactory practices regarding neurovascular assessment and the performance of isometric exercises, respectively. The entire population of patients under the study had unsatisfactory overall practices.

These results are confirmed by Abouala et al. (2023), who found that more than two-thirds of their groups have an unsatisfactory level of practice during the pre-implementation phase. ¹With regards to the relation between overall knowledge and socio-demographics, there was a relation between patients' overall knowledge and their age, educational level, smoking habits, and marital status.

This result is, to some degree, in line with research conducted by Morsy et al. (2021). It demonstrated that there was a highly statistically significant relation between the sociodemographic characteristics of the studied patients' scores and their level of total knowledge regarding age, occupation, and educational level during pre-guideline application.⁶

LIMITATION OF THE STUDY

The collection of data was restricted to Main Mansoura University Hospital and Emergency Hospital; therefore, the results obtained from this study may not be applicable to a broader population.

CONCLUSION

According to the current study's findings, all of the patients were found to have unsatisfactory level of knowledge and practice according self-care techniques for EF.

RECOMMENDATION

Based on the Result, it can be recommended that:

- It is crucial for educational and training programs to be designed and implemented. These programs should aim to provide patients with the necessary knowledge and skills through continuous education, which can be facilitated by employing audio-visual materials such as videos that are shared with the patients.
- Further investigation is warranted to evaluate the impact of preoperative instruction on both surgical outcomes and the engagement in self-care practices among patients utilizing external fixation devices.
- The establishment of a healthcare educational center within Mansoura University Hospital would be a valuable initiative to educate patients about their specific conditions and the essential instructions for self-care. This educational center could utilize various resources, such as manual booklets containing colored pictures and illustrated pamphlets, to cater to the diverse needs of patients, particularly those who may have limited literacy skills. By providing accessible and visually engaging educational materials, the healthcare educational center can effectively empower patients to take charge of their own care and well-being.

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