Effectiveness of Video-Assisted Teaching Intervention on Knowledge, Acute Complications, and Anxiety Level for Arrhythmic Patients Undergoing Cardiac Electrophysiology

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Abstract

Background: The Application of Electrophysiology Studies in Diagnosing and Treating a Wide Spectrum of Arrhythmias is Notable. The Emergence of Acute Complications in Arrhythmic Patients Undergoing Cardiac Electrophysiology Studies can have Pivotal Clinical Consequences. Regrettably, the extent of patients' understanding regarding these studies and their potential complications, which may induce anxiety, remains largely unexplored. Consequently, it is imperative that these individuals comprehensively grasp the technical and psychosocial aspects associated with Electrophysiology Studies to alleviate any apprehension. **Aim of the study**: To determine the effectiveness of video-assisted teaching intervention on knowledge, acute complications, and anxiety levels for arrhythmic patients undergoing cardiac electrophysiology. **Research design**: A quasi-experimental research design was used to conduct this study (pre-test and post-test). **Sample**: A convenient sample of 50 adult patients with arrhythmia undergoing electrophysiology study was recruited. **Setting**: This study was conducted in the cardiology department at Sohag University Hospital. **Tools used for data collection**: Tool I: Patient' assessment structure interview questionnaire which includes two parts; part (1): Personal data and part (2): Medical data, Tool II: Patient's knowledge assessment sheet regarding arrhythmia and cardiac electrophysiology, Tool III: **Patient's complications assessment sheet**, and Tool IV: Patient' state-trait anxiety level inventory. Results: There was a significant improvement in patients' total knowledge mean scores regarding arrhythmia and cardiac electrophysiology after video-assisted teaching intervention. Also, providing the video-assisted teaching intervention showed a statistically significant difference and reduction in anxiety and acute complications mean scores pre and post-video-assisted teaching intervention at *(P* < 0.001). **Conclusion**: Based on the present study findings, it could be concluded that video-assisted teaching intervention had a positive effect on reducing state-trait anxiety levels and acute complications for arrhythmic patients undergoing cardiac electrophysiology. **Recommendations**: Develop and implement nursing care standards for patients with arrhythmia undergoing cardiac electrophysiology study, Individualized psychological preparation should become a routine part of patient care before electrophysiology, and the application of the current study with more participants in other locations around Egypt to generalize the findings.

Keywords: Anxiety, Acute complications for arrhythmic patients, Cardiac electrophysiology, knowledge & video-assisted teaching intervention.

Introduction:

Arrhythmias signify health conditions that may impact the production or conduction of electrical impulses traveling through the heart, potentially causing abnormalities in heart rhythm and rate. Various types of arrhythmias exist, such as sinus, atrial, junctional, and ventricular arrhythmias, with subcategories for each category. Ventricular arrhythmias, comprising single premature ventricular complexes, ventricular escape rhythm, ventricular flutter, prolonged ventricular tachycardia, and fibrillation, are major contributors to morbidity and mortality (**Cronin et al., 2020**). Heart arrhythmias are widespread among individuals in developing countries. Arrhythmias can afflict people of all ages and may occur with or without underlying heart disease or with well-functioning structural hearts. By 2050, it is anticipated that more individuals with atrial fibrillation will inhabit Africa than China, the United States, or India, according to some future research (**Bonny et al., 2019**).

Ventricular arrhythmias, such as ventricular tachycardia (VT), contribute to sudden cardiac death (SCD), accounting for about 25% of annual deaths (**Samuel et al., 2022).** The most common cause of sudden cardiac death among young people is cardiac ventricular arrhythmias (**Offerhaus et al., 2020**).

The study of electrical conduction issues in the heart is known as electrophysiology. Technical know-how and a thorough understanding of the heart's electrical conduction processes are essential in this highly specialized field. Critical care for patients before, during, and following electrophysiology procedures will be provided by the electrophysiology nurse. The clinical methods used to diagnose and treat cardiac arrhythmias are collectively referred to as cardiac electrophysiology. These methods enable precise localization of the site of origin, a thorough examination of the mechanism or mechanisms underlying these arrhythmias, and, when necessary, conclusive treatment using catheter-based ablation techniques (**Devi et al., 2019)**.

Therefore, the following goals can be achieved by cardiac electrophysiology studies: determining the cause of syncope, stratifying patients for sudden cardiac death, determining the feasibility or effectiveness of nonpharmacologic therapy (e.g., radiofrequency ablation or implantable cardioverter/defibrillator therapy), and conclusively diagnosing an arrhythmia (supraventricular or ventricular tachyarrhythmias or a bradyarrhythmia) (**Homoud, 2019**).

The patient may have several tests scheduled before the cardiac electrophysiology investigation. These examinations give fundamental details about how the heart works. A 24-hour Holter monitor, an electrocardiogram (ECG), an echocardiogram, blood tests, and an exercise stress test will all be part of this testing. A heart monitor will be used while the patient is in the hospital. Before the EP study, antiarrhythmic medications may be discontinued. The doctor will determine whether this is necessary. A consent form will need to be signed by the patient. After midnight on the night before the test, the patient will fast. You can take any prescription drugs the doctor prescribes by taking sips of water. Before the test, the patient will be instructed to empty their bladder. You must take off your pajama bottoms and underwear. It is possible to wear glasses, dentures, or hearing aids throughout the process (**Northwestern Medicine, 2022).**

The hospital's catheterization or electrophysiology lab is where electrophysiology studies are carried out. The patient will receive a mild sedative to aid in relaxation and an intravenous line will be placed. The right side of the neck and possibly a section of both groin areas will be shaved and cleaned in advance of the catheters being inserted. The insertion site will be made numb with a local anesthetic. The patient will then have a large sterile sheet covering them from neck to toes. The insertion sites will be used to introduce tiny, flexible sheaths into the blood vessels. One or more catheters are then inserted into the sheath by the physician. To assist the physician in precisely positioning the catheters, an X-ray machine (fluoroscopy) provides images of the heart throughout the procedure. To pinpoint the precise region of the heart where the arrhythmia is occurring, an electrical "map" of the organ is made. This is accomplished by recording the heart's electrical activity during the onset of the arrhythmia. The EP study usually causes little discomfort for the patients. An hour or more may be needed for the procedure, depending on how complicated the arrhythmia is. The patient will be told to report any pressure or discomfort in the chest while the procedure is being performed. Pressure is applied to the insertion site to control bleeding after the EP study is finished, and the sheath and catheters are removed (**American Heart Association, 2023**).

The patient needs to understand that the procedure will take roughly an hour for the diagnostic cardiac electrophysiology study and two to four hours for the cardiac electrophysiology study with ablation. Along with taking the patient's medical history, a physical examination should be performed. A baseline electrocardiogram (ECG) and basic blood tests like serum electrolyte and urea should be performed on all patients. Patients taking warfarin require an international normalized ratio (INR) and a complete blood count. Furthermore, a woman of childbearing age should have her pregnancy test checked no later than two weeks before the procedure. The patient should be instructed to stop taking anticoagulation drugs at least three days before the procedure as part of their preparation. Moreover, antiarrhythmic drug use should be discontinued for a minimum of five half-lives. Before the procedure, the patient was also instructed to fast for six hours. The nurse also instructed patients to bring identification and insurance cards (no cash or credit cards), medications, and any necessary paperwork about previous hospital stays, along with only clothing (no jewelry) (**Glover et al.,2021**).

The patient will have his leg straight and be lying flat on his back when he returns from the catheterization lab. Before the patient can sit up, he must remain in this position for four hours. The area has more time to heal as a result. An hour following the procedure, the patient will be permitted to consume food and liquids. The patient's blood pressure, foot pulses, and the location of the catheter insertions will all be checked by a nurse. Unless directed otherwise, the patient can return to his regular daily **(Devi et al., 2019).**

Activities (walking, bathing, and showering) after being released from the hospital. To allow the incision site to heal, the only restriction is to refrain from straining or lifting heavy objects weighing more than ten pounds for five to seven days. Steer clear of strenuous activities like basketball, football, and exercise for a week. The patient's upper leg and groin may be a little tender and bruised. This is typical, but if the pain is severe or persistent, the patient needs to see a doctor. Unless his job requires him to lift heavy objects, the patient can resume work in three to four days. Regarding mobility and activity levels, the patient must adhere to the directives of the physician or nurse coordinator (**Gillingham, 2018**).

A crucial component of preparing patients for cardiac electrophysiology is psychological testing. Anxiety, a loss of control, denial, depression, and disruption of family functioning are common responses to cardiac arrhythmias in patients and their families. According to Carroll et al., anxiety is a common psychological reaction in patients with cardiovascular disease (60 percent). It can result in unintended clinical reactions like arrhythmias and ischemia, which can hurt the patient's cardiovascular outcome during cardiac catheterization. To ascertain the impact of a video-assisted teaching intervention on the anxiety levels and acute complications of patients with arrhythmias undergoing cardiac electrophysiology, this study was conducted (**Attin, 2021)**.

There are numerous opportunities for research into innovative awareness-raising techniques when using video-assisted teaching techniques. Furthermore, it fosters the expansion of positive developments in knowledge and the use of life-threatening situation management strategies. Video education would improve the quality of care by enabling patients to improve and hone their existing skills and knowledge. Modern techniques like online learning and video-assisted training modules are now available for nurses to receive continuing education (**Safwat and Khorais, 2018).** Lectures, demonstrations, discussion, self-education, and video-assisted instruction are some of the teaching methods used to improve comprehension and practice. Video is a collection of images that show moving scenes that are electronically collected, recorded, stored, transferred, and rebuilt. Language barriers can also be broken down by pictures since they can convey ideas without using words (**Balasubramanian et al. (2018).**

The video-assisted teaching method, which uses sight, voice, and motion to provide straightforward explanations of complicated concepts and issues, helps nurses learn more effectively. In addition to bridging educational gaps, it can transmit information in ways that spoken words or descriptions alone cannot. However, the film will benefit patients who struggle with reading (**Devi et al. 2019).** According to **Hassan (2019**), the video-assisted intervention approach is among the most significant emerging technologies. The technical and psychological facets of cardiac electrophysiology must be understood by nurses to provide appropriate care. The nurses' main responsibility is to keep the patient in the electrophysiology lab safe (i.e. E. preserve aseptic procedures and take action when issues arise. To provide progressive care, such as creating educational programs and support groups for patients and their families, nurses must be knowledgeable and skilled in light of the rapid advancements in technology and the growing number of patients with advanced degrees (**Attin, 2021**). In addition to providing safe transportation, medication administration, assistance with basic personal care needs, bleeding control, and hemostatic maintenance, critical care nurses must evaluate and care for patients who have had cardiac catheterization procedures. By doing this, the patient's vascular complications will be reduced (**Arathy, 2021**).

The need for better nursing education and learning strategies has been significantly influenced by technology. Different approaches and modern techniques are required for teaching a range of skills. Consequently, video-assisted intervention is regarded as a suitable teaching approach. One advantage of video-based learning is that in addition to the presenter's voice, viewers can see figures, gestures, images, and demonstrations (**Rubi & Rani, 2019**). According to Zhou et al., patients should receive consistent information and clear instructions to facilitate their transition from hospital to home care. Patients have reported better learning outcomes because they believe that video-

assisted intervention is easier to understand than other approaches and can adapt to a variety of learning styles (**Dahodwala et al., 2018**).

A nurse must be capable of providing accurate patient education, physical examinations, patient monitoring, and nursing care both before and after cardiac electrophysiology procedures. Comprehensive comprehension of interventional techniques, ability to identify unforeseen circumstances, and anticipation of options centered on solutions. For many patients, invasive cardiac procedures like electrophysiology studies can cause a nxiety (**Nekouei et al. in 2021. Trotter & Co**, **2021**). The manifestation of such emotion is often called state anxiety, which is an emotional disorder in which tension, fear, and worry cause the autonomic nervous system to become more active in reaction to the situation (**Ayers et al., 2021**). The sympathetic nervous system's reaction to stress raises plasma adrenaline levels, which in turn raises blood pressure and heart rate. Nursing staff caring for patients with anxiety should also be aware of the following adverse events: decreased serum potassium levels, cardiac arrhythmias, and changes in mental state that may impair the ability to make appropriate treatment decisions (**Chan & Cheu ng, 2023; Pritchard, 2021).**

Significance of the study:

Today's nursing staff can be engaged in nursing education in a novel and approachable way by using video teaching techniques. Video teaching interventions are easily incorporated into nursing education at any level and are considered an essential component of the curriculum that connects theory and practice. Using state-of-the-art technologies to enhance the learning environment is now required of nurses**.** Consequently, the purpose of this study was to ascertain how well a video-assisted teaching intervention affected the knowledge, acute complications, and anxiety levels of arrhythmic patients undergoing cardiac electrophysiology. Patients undergoing cardiac electrophysiology may experience both minor and major acute complications. Major complications are those that need to be addressed to avoid irreversible harm or death because they are likely to cause permanent sequelae (**Vasheghani et al. (2018**).

Although the risk of stroke is increased with curative atrial fibrillation ablation, these major complications include death and cerebrovascular accidents (0%) to 0%. Tamponade, vascular damage, deep vein thrombosis, and heart block requiring a permanent pacemaker (0–5%) are additional serious complications. The probability of these events varies according to how close the ablation lesion is to the atrioventricular node (**Marry & Adrianne, 2019**).

According to **Padia et al., (2021**) minor complications are defined as an adverse event related to treatment that necessitates minimal therapy or no treatment at all, with or without an overnight hospital stay for observation.

Including vascular access problems like arteriovenous fistula, mild-to-moderate pericardial effusion, bleeding, and hematoma (Marry and Adrian ne, 2019). With a focus on early detection and intervention for anticipated problems, post-procedure nursing management is similar to that of a patient following cardiac catheterization. To lessen the negative effects of complications, the nurse must keep a close and ongoing eye on the patient and act quickly and appropriately. Restricting activity until hemostasis is achieved and tending to the catheter insertion site to avoid complications like bleeding are two examples of immediate postoperative care guidelines (Reinisch et al. (2019).

Aim of the study:

The current study aimed to determine the effectiveness of video-assisted teaching intervention on knowledge, acute complications, and anxiety levels for arrhythmic patients undergoing cardiac electrophysiology through:

1. Assessing the patients' knowledge regarding arrhythmia and cardiac electrophysiology.
2. Assessing the patients' acute complications regarding cardiac electrophysiology.
3. Assessing the patients' anxiety regarding cardiac electrophysiology.
4. Designing and implementing video-assisted teaching intervention regarding cardiac electrophysiology based on the patient's actual needs.
5. Evaluating the effectiveness of video-assisted teaching intervention on knowledge, acute complications, and anxiety level for arrhythmic patients undergoing cardiac electrophysiology.

Research hypotheses:

H1: Patients' total knowledge mean scores who received video-assisted teaching intervention will be higher regarding arrhythmia and cardiac

electrophysiology post-intervention than pre-intervention.
H2: Patients who received video-assisted intervention teaching will have fewer complications regarding cardiac electrophysiology post-intervention than pre-intervention.
H3: Patients' total anxiety mean scores who received video-assisted teaching intervention will be less regarding cardiac electrophysiology post-intervention than pre-intervention.

Subjects and Methods:

Research design:

A quasi-experimental research design was used to conduct this study (pre-test and post-test). Patients self-select or are randomly assigned to one of many therapy groups in a quasi-experimental study to examine the real effectiveness and safety of non-randomized treatments.

Settings:
This study was conducted in the cardiology department at Sohag University Hospital., situated on the hospital's third floor. They are divided into four rooms. The number of beds in the first room was six, the second room had four, the third room had four, and the fourth room had four. These settings were chosen because the previously chosen setting served the nation's most populous region and had a high prevalence of patients.

Subjects:
A convenient sample of 50 adult patients with arrhythmia undergoing electrophysiology study were recruited for the study.

Tools of data collection:

Tool (I): Patient's assessment sheet:
It was designed and developed by the researcher based on the relevant recent national and international literature in plain Arabic from true-or-false, multiple-choice open-ended questions which include two parts:
Part I: Patient's personal data: -
The purpose of this section was to assess the patient's demographic data, consisting of six items (age, gender, level of education, and occupation), and to examine patient habits such as smoking.
Part II: Patient's Medical Data:
The purpose of this section was to evaluate the patient's medical data and consisted of (4) items as types of arrhythmia, comorbidities, length of stay and duration of cardiac electrophysiology study, and present medical history including symptoms and signs (chest pain, syncope, shortness of breath, palpitation, dizziness).

Tool II: Patient's knowledge assessment sheet:
The researcher created this questionnaire using the following literature as a guide (**Vyas & Murti, 2023; Sattar & Majeed. 2022; Yamada et al., 2022; Majeed & Sattar, 2022; Petra. et al., 2021; Kupo. et al., 2020; Amin, 2020)** to gauge the patient's familiarity with electrophysiology research and arrhythmia. It was divided into two sections:
Part I: Evaluate the patient's understanding of arrhythmia, which comprised six questions (numbered 1–6) about the condition's definition, symptoms, risk factors, dangers, complications, and treatment. A total of nine questions (ranging from seven to fifteen) covering the following topics was included in
Part II: Assessing the patient's knowledge of cardiac electrophysiology studies: definition, indications, benefits, contraindications, preparations, time, complications, instructions immediately after, and discharge instructions.

The knowledge questionnaire's scoring system consisted of 15 questions, with two points given for a fully correct response, one point for a partially correct response, and zero for an incorrect response. The overall knowledge scores were arranged as follows: lower than 60 was regarded as an unsatisfactory level and higher than 60 as a satisfactory level.

Tool III: Patient's complications assessment sheet:

The researcher based this tool's design and development on the following literature. (**Vyas & VMurti, 2023; Yamada et al., 2022; Sattar & Majeed. 2022),** a cardiac electrophysiology study was conducted to evaluate acute complications for patients with arrhythmias. It was divided into two sections:

Part I: Minor Acute Complications: Evaluate minor acute complications, such as bleeding, mild-to-moderate pericardial effusion, arteriovenous fistula, vascular damage, and hematoma at the puncture site, in patients who had cardiac electrophysiology studies.

Part II: Serious acute issues. Examine the following serious acute complications in patients who had EPS: tamponade, AV block, cerebrovascular accident, cardiopulmonary arrest, and death.

Tool IV: Patient' state-trait anxiety level inventory

It was used to gauge how anxious patients were about the electrophysiology study. **Spielberger et al., (2010**) created and tested this self-report scale, which asks participants to rate their own intensity on a four-point scale. The SAI is a commonly used and acknowledged scale on a global scale. It has been used in nearly 8000 published research studies in the social sciences, including psychology, medicine, and education (**Spielberger, 1985; Spielberger, 2010**). The scale's simple design makes it accessible to patients with little to no education (Spielberger, 1985; **Spielberger, 2010).** The STAI scale is a sensitive measure of the degree of transitory anxiety and asks respondents to describe their current feelings. Tension, anxiety, worry, and apprehension are all assessed by the STAI scale. The SAI is a self-reported, 20-item Likert scale that measures an individual's current level of anxiety. There are four possible answers to each statement: "not at all," "somewhat," "moderately so," and "very much so.". Higher scores on the SAI indicate a higher level of anxiety in the state (**Spielberger, 2010**). The overall score ranges from 20 to 80.

According to multiple researchers (**Spielberger, 1985; Spielberger, 2010),** the scale has good psychometric properties. Its validity and reliability have also been confirmed. A Cronbach's alpha of 0.91–0.94 indicated the scale's internal consistency reliability (Spielberger, 2010), while a test-retest correlation of 0.86 indicated stability. **Spielberger (2010**) further supported concurrent validity, face validity, and content validity. Languages: 40 languages, including Arabic, are available for the SAI. The Arabic version of SAI had an internal consistency coefficient of 0.92.

Scoring system:

Anxiety levels between 20 and 39 are regarded as mild.

- Anxiety levels between 40 and 59 are regarded as moderate.
- Anxiety levels between 60 and 80 are regarded as severe.

Procedures

The study was conducted in three phases (preparatory, implementation, and evaluation phases)

Preparatory phase:

Tools development: Using books, articles, periodicals, magazines, and references, data-gathering tools were created based on an examination of the local, worldwide, historical, and contemporary related literature in a variety of areas.

Validity and reliability of tools:

To determine the extent to which the employed instruments measure what was intended to be measured, content validity was carried out. A panel of two experts in medical-surgical nursing and three experts in critical care nursing reviewed the investigator's tools to assess whether they were appropriate and clear for achieving the study's goal. Nothing was changed. Tool I's reliability was determined to be (α = 0 89), tool II's to be 0.879, and tool III's to be 0.885 using Cronbach's alpha coefficient. Spielberger et al. (1983) found that the internal consistency coefficients for the patient state-trait anxiety questionnaire ranged from 86 to 95.

Ethical considerations:

Ethics approvals were obtained from the nursing faculty's ethical committee at the University of Sohag. The directors of the previously stated locations were consulted before the study started. Before the investigation began, all of the nurses who were the focus of the study gave their verbal approval to take part in it after being briefed about its goals and design. Participants were free to withdraw from the study at any time, and confidentiality was maintained at all times. Only research was conducted using their data.

Pilot study:

To determine the tools' clarity and applicability, a pilot study included 5 patients or 10% of the study population. Pilot study individuals were included in the study sample, and no changes were made to the study equipment in response to the pilot's results.

Fieldwork:

The six-month data collection period ran from the start of July 2023 to the conclusion of December 2023. During the morning shift, the researchers were accessible three days a week, from Sunday to Tuesday. The following stages were included in the implementation of the video-assisted teaching intervention:

Assessment phase:

Beginning with an introduction and explanation of the nature and purpose of the study, as well as the contents of the video-assisted teaching intervention, the researchers met the patients under study at the beginning of this phase. A systematic questioning questionnaire was used to interview each patient

separately to gauge her level of awareness about percutaneous coronary intervention (pre-video-assisted intervention). After obtaining standardized instructions on how to respond to the instruments, participants were invited to complete knowledge, acute complications, and the Arabic version of the Spielberger State Anxiety Inventory (SAI). This portion took roughly four weeks, with an average completion time of twenty to thirty minutes for the tools as a pre-test.

Planning phase:

The researchers used the needs found during the assessment phase as a guide and reviewed relevant literature before creating the videos. The purpose of the design was to enhance patients' patient`s knowledge, of acute complications, and anxiety levels for arrhythmic patients undergoing cardiac electrophysiology.

The researchers in this study used the following procedures to create the videos:

1. Data gathering and review of literature.
2. Content preparation and organizing.
3. Writing the screenplay for the video in order.
4. Study the research.
5. Making the videos.
6- Modifying the Videos.
7-Reviewing the Videos.

1- Data gathering and review of literature:

2- An exhaustive literature review was conducted from textbooks, journals, online sources, and magazines regarding cardiac electrophysiology intervention to prepare the videos before starting the video-assisted teaching intervention. A critical synopsis of the relevant literature is provided in the literature review. Additionally, much care was taken to make sure the information was correct, current, properly arranged, easy to understand, and uncomplicated.

2- Content preparation and organizing:

The video information was generated and arranged under several headings based on the goals of the study.

3- Writing the screenplay for the video in order:

The prepared contents were used to create a script. It had all of the scenarios from the videos, including the introduction, goals, guiding principles, and procedures for percutaneous coronary intervention. The screenplay for a video is essentially a blueprint or map of what will be included in the film.

4- Study the research:

The researchers interviewed the patients; throughout the interview, they were asked open-ended questions to gauge their level of knowledge about cardiac electrophysiology. Observe and record the areas where they are lacking in knowledge.

5- Making the videos: -

According to the pre-written script, the researchers have customized the PowerPoint video record for the theoretical portion and the video for the practical portion in the (clinical lab) setting.

"- The educational goals are met by the engaging and inspiring opening of the theoretical and practical videos.

"- The films accurately and simply explained each phase of the percutaneous coronary intervention in language that was appropriate for the patients' educational level.

"- After every video, the key points were outlined.

The video includes section breaks and section titles.

- The technical quality of the video was passable.
- Each video's duration and pace are suitable.

The video satisfies the research goals.

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6- Modifying the Videos:

Editing videos involves adjusting and rearranging the shots in the video. Choosing the best video, removing unwanted film, and creating a flow are the objectives of editing. Enhance the movie with effects, graphics, and music, change its tempo, style, or atmosphere, and present it from a unique perspective. Then, watch it and make notes. Effects, color correction, music, titles, and sound editing were added. A professional editor worked on the prepared videos.

7- Reviewing the Videos:

Three critical care nurses and two medical surgical nursing specialists assessed the videos. Their criticism, recommendations, opinions, and suggestions were acknowledged and made.

The main goals of the video-assisted teaching intervention were to reduce patients' complications, and anxiety, and improve knowledge after cardiac electrophysiology intervention.

Specific objectives:

The patients **under study were able to do the following after the video-assisted intervention:**

- Define cardiac electrophysiology
- List indications of cardiac electrophysiology
- Mention benefits of cardiac electrophysiology
- Enumerate contraindications of cardiac electrophysiology
- Explain the preparations for cardiac electrophysiology intervention
- Illustrate the time of cardiac electrophysiology
- Enumerate complications of cardiac electrophysiology

- Explain instructions immediately after cardiac electrophysiology intervention

Implementation phase:

Five sessions over four months, from July 2023 to the end of October 2023, were used to complete the implementation phase. Five video sessions, comprising two videos for the theoretical and three for the practical aspects, were used to carry out the study objectives.

Each video session involved ten groups of ten patients each. The day, time, location, subjects, and length of each video session were all included in a patient-friendly schedule. The length of the video sessions for each theoretical and practical session was between forty and forty-five minutes, and they were held in the morning on Sunday, Monday, and Tuesday of each week. From 10:00 AM to 10:45 PM, theoretical video sessions were held. The definition, indications, benefits, contraindications, preparations, time, complications, instructions immediately after, and discharge instructions.

For cardiac electrophysiology, intervention were the main topic of discussion in the theoretical video sessions.

The researchers provided comments, addressed any concerns, and proceeded to reaffirm the knowledge that had been gathered. A laptop and data show was used to project the videos onto the patients. On the same three days, from 11.30 to 12.30 PM, the practical sessions began. During the practical sessions, the patients under study were shown how to measure tension and anxiety, as well as procedures about nursing care practices before, during, and following cardiac electrophysiology intervention. Using clear, concise language that is appropriate for the patients, video-assisted teaching interventions assist in the explanation of complicated concepts. Additionally, where necessary, give the patients the information they require engagingly. To improve sharing in video sessions, incentives, and reinforcement were employed in the study.

Contents of each video in all sessions: -

Session NO	Subject content	Teaching methods
1	An introductory session that emphasized establishing rapport between the researchers and the patient participating in the study and an explanation of the purpose of the program	• Discussion
2	Education about Introduction to cardiac electrophysiology Intervention, Definition of cardiac electrophysiology intervention, Indications of Cardiac Electrophysiology Intervention	• Powerpoint presentation • Discussion
3	Education about the Time of cardiac electrophysiology intervention, Complications of cardiac electrophysiology intervention, Contraindications of cardiac electrophysiology	• Teaching videos
	Education about Preparing for cardiac electrophysiology intervention; Instructions before, during, and after cardiac electrophysiology intervention	•
4	Education about anxiety, Tips for dealing with anxiety good communication with others, dealing with negative thoughts, maintaining a healthy daily routine, giving and taking support from family, friends, and others to enhance the sense of security.	• Powerpoint presentation • Discussion
5	It consisted of techniques to cope with anxiety as notifying the studied patients about meditation (definition, steps of meditation) and the importance of practicing exercises such as deep breathing exercises, muscle relaxation exercises, and yoga exercises.	• Powerpoint presentation • Teaching videos
6	Summary of the program and the studied patients were asked to answer the questionnaire in the online link immediately post-intervention.	• Discussion

During these sessions, patients were also taught the importance of coordination and cooperation. Each patient received a flash drive with all of the videos on it. Additionally, a formal video advertisement was sent to each patient through a WhatsApp group. Patients' baseline anxiety levels were assessed during the baseline period by having them complete the State Anxiety Inventory (SAI) approximately 24 hours beforehand. Patients allocated to the control group continued receiving their usual care. Patients in the control group were told that their next anxiety evaluation would occur four hours after the cardiac electrophysiology procedure, while patients in the

intervention group were offered the educational intervention after baseline data collection.

After the patients saw the movie, the researcher spoke with them for two minutes, encouraging them to ask questions and teaching them anxiety-reduction techniques such as progressive muscle relaxation, breathing exercises, and meditation. Finally, the patient receives a booklet from the researcher that provides a summary of the material presented in the movie.

Evaluation phase:

Following the use of a video-assisted teaching intervention, the patient's knowledge, acute complications, and anxiety level for arrhythmic patients undergoing cardiac electrophysiology were assessed once more. This phase lasted roughly one month and involved measuring patients' knowledge, complications, and anxiety regarding cardiac electrophysiology intervention after the latter had received verbal instructions from the researchers and a video and booklet on the procedure by using the same tools used in the pre-test.

Statistical analysis:

The data provided by the research patients was organized, edited, coded, and entered into a personal computer. The Statistical Package for Social Sciences (SPSS version 20.0) was used to analyze the data. The data were displayed as means and standard deviations for qualitative elements and as frequencies and percentages for quantitative variables. These descriptive statistics were applied. To compare quantitative continuous data, the study used a t-test. Pearson correlation analysis was used to compare the mean scores of the patients' knowledge, complications, and anxiety before and after the implementation of the video-assisted teaching intervention. Chi-square is used to test the study hypotheses. A statistically significant difference was considered to exist if the p-value was less than 0.001, no statistically significant difference was discovered if the p-value was less than 0.05, and no significant difference was found if the p-value was greater than 0.05.

Results:

Table (1): This table shows that (56%) of the patients' age ranged between 35:50 years, with a mean age of (52.2±7.5) years, (80%) were males. Moreover, (36%) had secondary school education, the majority of them (72%) came from urban areas and 78% of them were smokers.

Table (2): Illustrated that more than half of the studied patients (54.0%) were diagnosed with SVT. Regarding comorbidities nearly one-third of studied patients (32%) had a heart disease. Regarding the length of stay nearly half of the studied patients (46%) staye d one day with mean stay (1.88±0.65). Regarding the duration of the EPS procedure, nearly half of the studied patients (44%) underwent a procedure lasting 2-3 hours, with a mean duration of (1.89±.76) hours.

Figure (1) Shows that all of the studied patients (100%) have chest pain and palpitation while 98% of them have shortness of breath.

Table 3 illustrates that there were statistically significant differences and improvements in all knowledge items following video-assisted teaching intervention regarding cardiac arrhythmia (P<0.001).

As seen in **Figure** 2, 86% of the patients undergoing cardiac electrophysiology had satisfactory knowledge post- video-assisted teaching intervention regarding cardiac arrhythmia and cardiac electrophysiology, while 94% had unsatisfactory knowledge in the pretest.

Table 4 illustrates that there were statistically significant differences and improvements in all knowledge items following video-assisted teaching intervention regarding cardiac electrophysiology study (P<0.001).

Table (5): This table illustrates that regarding minor acute complications, less than one-fifth of (18.0%) of the studied patients had hematoma at the puncture site, (16.0%) had bleeding, (6.0%) had mild to moderate pericardial effusion and (4.0%) had vascular damage. Major complications, such as AV block occurred only in around 4%.

Figure 6: Shows that there was a highly significant statistical difference among patients undergoing cardiac Electrophysiology pre and post-video-assisted teaching intervention at p= 0.001.

Figure 3 shows that 54% of the patients undergoing cardiac Electrophysiology had severe anxiety levels pre-video-assisted teaching this percentage decreased to 6% post-video-assisted teaching

Table (7): This table illustrates that there is a highly significant statistical correlation between patients' total knowledge, practice, and the patient's total anxiety scores pre and post-video-assisted teaching intervention.

Table (1): Patients' data undergoing cardiac Electrophysiology (n=50)

Variables	No.	%
• **Age**		
20:<35 years	2	4
35:50 years	28	**56**
>50:65 years	16	32
>65 years	4	8
Mean± SD	52.2±7.5	
• **Gender**		
Male	39	**78**
Female	11	22
• **Educational level**		
Illiterate	9	18
Can read and write	16	32
Secondary education	18	**36**
High education	7	14
• **Place of residence**		
Rural	14	28
Urban	36	**72**
Smoking habit		
Smoker	39	**78**
Nonsmoker	11	22

Table (2): Medical data among the studied arrhythmic patients undergoing cardiac electrophysiology (n=50).

Types of arrhythmia	No.	%
SVT	**27**	**54**
Accessory pathway	4	8
Ventricular tachycardia	3	6
PVCS	9	18
Sinus tachycardia	8	16
Comorbidities		
Non	15	30
Diabetes	7	14
Hypertension	**12**	**24**
Heart disease	**16**	**32**
Duration of procedure		
Two hours	15	30.0
From 2-3 hours	23	46.0
More than three hours	12	24.0
Mean±SD (range)	**1.88±0.65**	
Length of stay		
1 Day	**25**	**50**
2 Day	22	44.0
From 3 days and More	3	6.0
Mean±SD(range)	**1.89± .76**	

**SD – standard deviations SVT: supraventricular tachycardia PVCS: premature ventricular contractions*

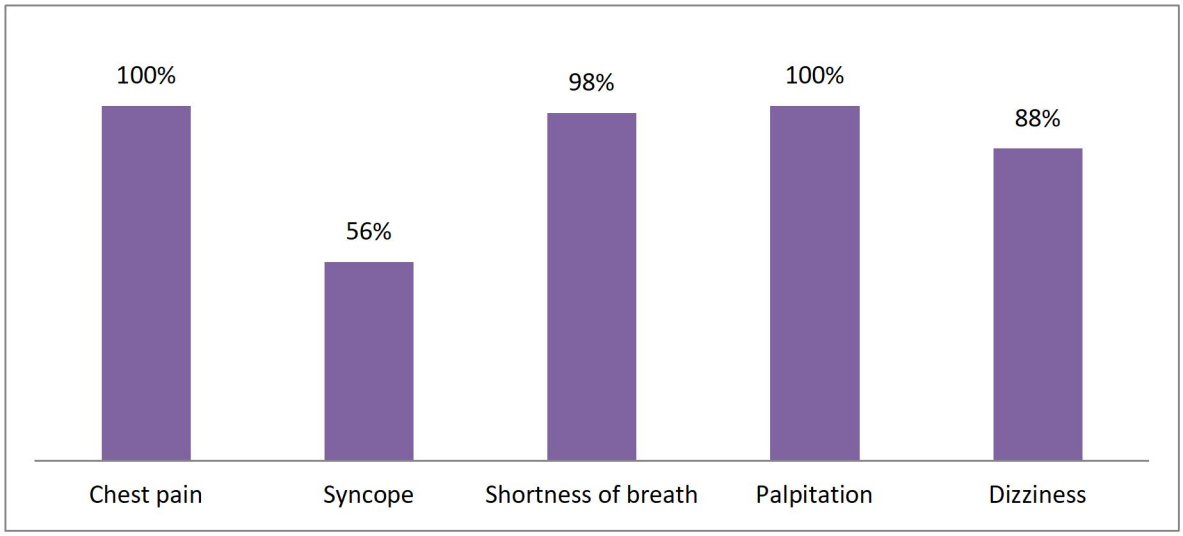

Figure (1) arrhythmia symptoms and signs among the studied patients undergoing cardiac electrophysiology **(n=50)**.

Table (3): Comparison between patients' knowledge of pre and post – video-assisted teaching intervention regarding cardiac arrhythmia (N=50)

Items	Pre- video-assisted teaching intervention	Post- Post-video-assisted teaching intervention	X^2	P
1-Definition of arrhythmia.	16(32)	48(96)	78.22	<0.001*
2- Symptoms and signs of arrhythmia	15(30)	46 (92)	82.55	<0.001*
3-Risk factors of arrhythmia.	7 (14)	44 (88)	66.77	<0.001*
4-Hazards of arrhythmia	12 (24)	43 (86)	46.88	<0.001*
5-Complications of untreated arrhythmia.	11 (22)	45 (90)	57.22	<0.001*
6-Treatment of arrhythmia.	11(22)	42(84)	62.44	<0.001*

(*) Statistically significant at P ≤0.05

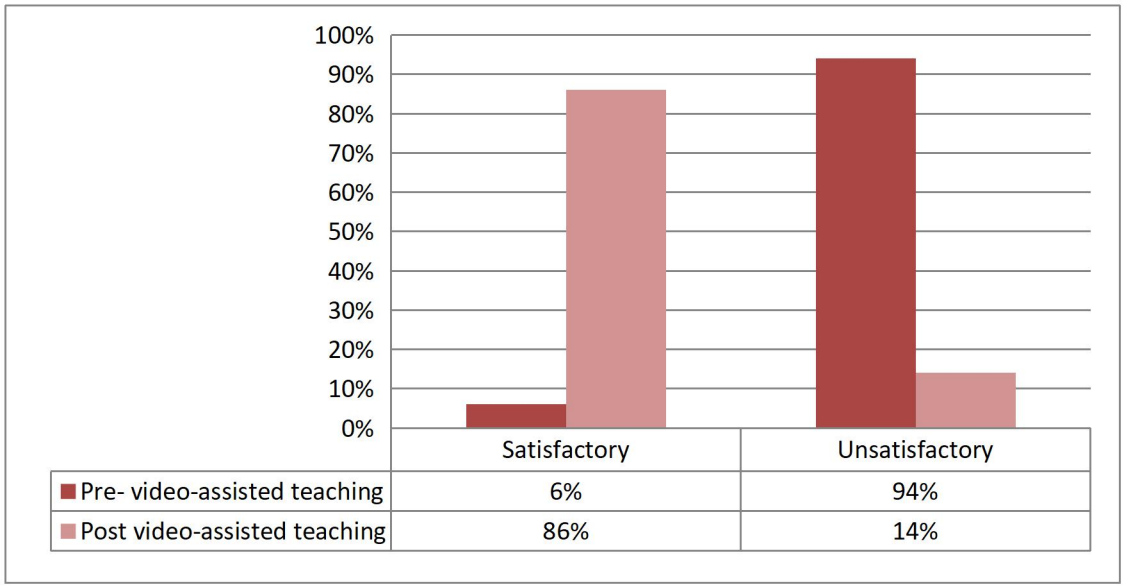

Figure (2): Total knowledge level regarding cardiac arrhythmia and cardiac electrophysiology among the studied patients undergoing cardiac electrophysiology pre and post-video-assisted teaching intervention (N = 50)

Table (4): Comparison between patients' knowledge of pre and post – video-assisted teaching intervention **regarding** cardiac **arrhythmia (N=50)**

Items	Pre- video-assisted teaching intervention	Post- Post-video-assisted teaching intervention	X^2	P
1-Definition of cardiac electrophysiology study.	15(30)	46 (92)	78.55	<0.001*
2-Indications of cardiac electrophysiology study.	7 (14)	44 (88)	88.77	<0.001*
3-Benefits of cardiac electrophysiology study	12 (24)	43 (86)	69.88	<0.001*
4-Contraindications of cardiac electrophysiology study	11 (22)	45 (90)	56.22	<0.001*
5-Complications of cardiac electrophysiology study.	11(22)	42(84)	93.44	<0.001*
6-Duration of cardiac electrophysiology study	13 (26)	47 (94)	84.34	<0.001*
7-Preparations before cardiac electrophysiology study	8 (16)	45 (90)	75.76	<0.001*
8-Instructions followed immediately after electrophysiology study	13 (26)	44 (88)	83.22	<0.001*
9- Instructions followed after discharge.	12 (24)	45 (90)	79.54	<0.001*

Table (5): Distribution of studied patients undergoing cardiac **Electrophysiology** according to their **Presence of** complications **post** video-assisted teaching intervention **(n=50)**.

Complications	Not present	Present	X^2	P
Minor Complication				
Hematoma puncture site	41(82)	9 (18)	57.77	<0.001*
Bleeding	42 (84)	8 (16)	49.88	<0.001*
Mild to moderate pericardial effusion	47 (94)	3 (6)	87.22	<0.001*
Arteriovenous fistula	50 (100)	0(0)	49.44	<0.001*
Vascular damage	48 (96)	2 (4)	63.34	<0.001*
Major Complication				
cardiopulmonary arrest	50 (100)	0 (0)	58.76	<0.001*
CVA	50 (100)	0 (0)	68.33	<0.001*
Tamponade	50 (100)	0 (0)	47.46	<0.001*
AV block	48 (96)	2 (4)	47.78	<0.001*
Death	50 (100)	0 (0)	47.89	<0.001*

CVA: cerebrovascular accident AV block: atrioventricular block

Table (6): Total Anxiety Mean Scores among patients undergoing cardiac **Electrophysiology pre and post**-video-assisted teaching intervention **(n=50)**

Items	Pre- video-assisted teaching intervention	Post- Post-video-assisted teaching intervention	t/ p-value
Total mean anxiety scores	62.22 ± 8.7	46.3 ± 5.4	5.65 / 0.001

Significance level ≤ 0.05

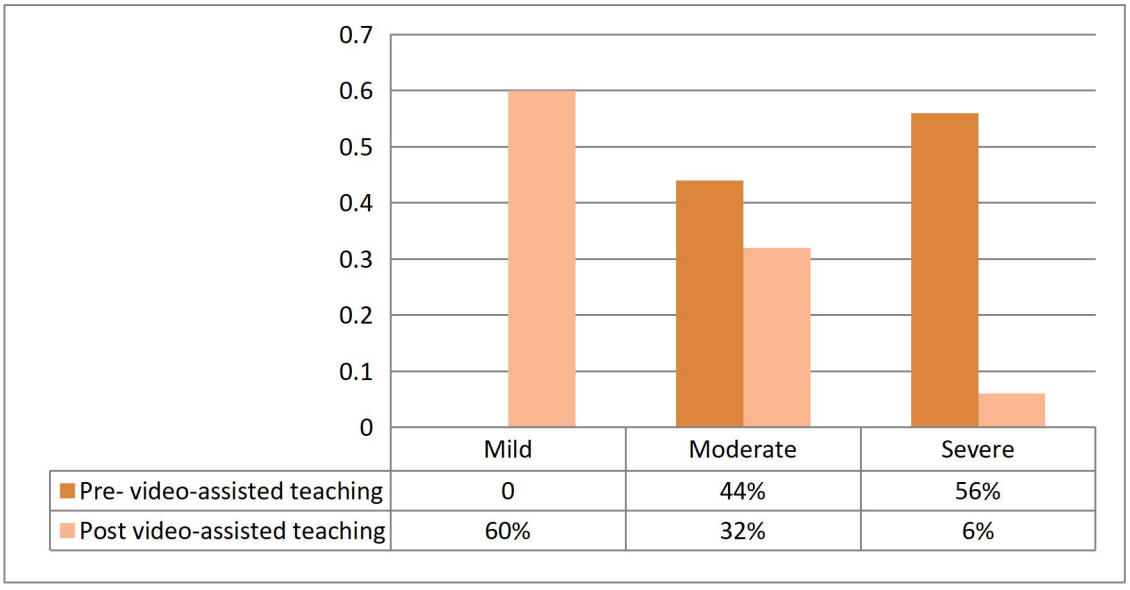

Figure 3: Total Anxiety Levels among patients undergoing cardiac **Electrophysiology pre and post**-video-assisted teaching intervention **(n=50)**

T**able (7): Correlation between total knowledge, complications, and anxiety scores among patients** undergoing cardiac **Electrophysiology pre and post**-video-assisted teaching intervention **(n=50)**

Variables	r	P value
Nurses' total knowledge scores and patients' total anxiety scores (before intervention)	- 0.64	0.001
Nurses' total knowledge scores and patients' total anxiety scores (after intervention)	-0.54	0.001
Nurses' total **complications** scores and patients' total anxiety scores (before intervention)	- 0.46	0.001
Nurses' total **complications** scores and patients' total anxiety scores (after intervention)	- 0.72	0.001

Significance level at p ≤ o.o5

Discussion:

The focus of cardiac electrophysiology research has quickly shifted from diagnostic techniques to therapeutic strategies. Several cardiac arrhythmias that were previously treated with antiarrhythmic drugs, cardioversion, or heart surgery are now frequently treated using cardiac ablation (**Shoulders et al., 2016).** A common and clinically significant cardiovascular condition, arrhythmias afflict millions of people worldwide. Between 2.7 to 6.1 million people in the US alone suffer from AF, and by 2030, there will likely be 12.1 million instances globally (**Chaudhary et al., 2023**).

A new method for diagnosing and treating heart arrhythmias is called a cardiac electrophysiology study. Complications from radiofrequency catheter ablations (RFCA) and electrophysiology investigations can be numerous. (**Vasheghani and others, 2018**) Therefore, the current study's goal was to ascertain how well a video-assisted training intervention affected the knowledge, acute problems, and anxiety levels of arrhythmic patients undergoing cardiac electrophysiology.

Based on their demographic characteristics, the study sample consisted of forty patients who underwent cardiac electrophysiology. The majority of the subjects were male, and the study found that over half of the subjects were between the ages of 35 and 50, with a mean age of 52.2+7.5 years. Additionally, the majority of them were smokers, most of them were from urban regions, and over one-third had completed secondary school. **Mostafa's (2019)** study supports this finding, revealing that over half of the patients in the study were between the ages of forty and fifty.

These findings were consistent with those of **Nekouei et al., (2021**), who compared the anxiety levels of cardiac patients who were candidates for angiography with those of the general population in the province of Isfahan. They discovered that most of the study participants were men between the ages of 40 and 65. The majority of them had an associate degree (26.4%) or had completed secondary school (25.5%). Additionally, **El-Medany & Grubb (2024)** discovered that 59 (41.8%) of the 141 patients who had an electrophysiological study performed in a Scottish tertiary center between 2009 and 2012 were male, with a mean age of 50 years at follow-up. This conclusion is supported by a study conducted by **Seloma et al., (2019**) which discovered that over half of the patients in the study were between the ages of 35 and 50.

According to the current study, women made up more than half of the sample. This conclusion is supported by a study conducted by **Vasheghani et al. (2018),** which discovered that over half of the patients under investigation were female. This fact is corroborated by a study conducted by Wood et al. (2019), which revealed that over 50% of the patients under investigation were female.
Regarding residency and educational attainment, the current study found that over two-thirds of the patients had completed secondary school, and over three-quarters resided in rural areas. This finding was in contrast to a study by **Amin et al. (2020**), which found that over one-third of the patients had completed secondary school and around a quarter were urban population.

Regarding smoking, the current study indicated that roughly one-third of the sample was currently a smoker, while over two-thirds had never smoked. These results are comparable to a study by **Amin et al. (2020**), which discovered that over one-third of the sample was a quitter and that around half of the sample had never smoked.

In terms of the patient's medical records, the study found that half of the patients had coronary artery

disease as a co-morbid condition, and over one-third of the patients were diagnosed with ventricular tachycardia. In line with these conclusions, **Marai et al. (2020)** reported that ischemic heart disease was a risk factor for the entire study sample, which consisted of 11 patients with recurrent unstable ventricular tachycardia, in their investigation of the clinical and electrophysiologic outcomes of patients undergoing percutaneous endocardial ablation of scar-related ventricular tachycardia. In contrast, **Vasheghani-Farahani et al. (2018)** discovered in a study titled "Acute Complications in Cardiac Electrophysiology Procedures: A Prospective Study in a High-volume Tertiary Heart Center" that AV nodal reentrant tachycardia (AVNRT) was the most prevalent arrhythmia (28.2%), and the most common comorbid disease was hypertension.

This result contradicts the findings of **Seloma et al. (2019),** who reported that roughly one-third of the patients in the study had VT diagnoses. In terms of comorbidities, the current study discovered that heart disease, hypertension, and diabetes affected nearly one-third, one-quarter, and nearly one-fifth of the patients, respectively. This result is comparable to a study by **Seloma et al. (2019**), which discovered that around half, one-fourth, and one-fifth of the sample under study had diabetes, hypertension, and heart disease, respectively.

In terms of the disease's onset, the results indicated that over half of the sample under study had arrhythmia for a duration ranging from one to five years. This finding was consistent with a study by **Kupo et al. (2020**), which found that over half of patients had discovered they had arrhythmia during that time.

Regarding comorbidities, coronary artery disease, and hypertension were present in approximately one-fifth of the individuals in the study. This result is consistent with a study by **Bergtun et al. (2019**), which discovered that almost one-fifth of the patients had coronary artery disease and hypertension. Additionally, a study by **Afzal et al. (2019)** showed that heart failure, coronary artery disease, and different arrhythmias involving atrial fibrillation and ventricular arrhythmias were among the cardiovascular illnesses that manifested as hypertension.

Regarding the length of the cardiac electrophysiology procedure, the current study found that the patients under study had average procedure duration of 1.89±.76 hours. This is consistent with the findings of **Schreiber et al. (2019),** who reported that the procedure duration of their study participants was 2.23± 0.78 days.

The present study found that the patients' duration of stay was 1.88±0.65 days, which is consistent with the findings of **Abdur Rehman et al. (2019),** who stated that the length of stay of their study participants was 2.15±3.00 days.

Concerning the current medical history, the results of the investigation showed that every patient who was examined experienced chest pain, palpitations, dizziness, and shortness of breath. According to a study by **De Luna & Baranchuk (2017),** palpitations, shortness of breath, fainting episodes, chest discomfort, and fluttering in the chest are among the most common symptoms of arrhythmias. This finding is consistent with them.

The current study demonstrated that after a video-assisted teaching intervention of cardiac arrhythmia, there were statistically significant gains and differences in all knowledge items. The researcher believes that these findings demonstrated the benefits of a teaching strategy that uses video to enhance patients' understanding.

The current study showed that while nearly all of the patients receiving cardiac electrophysiology had unsatisfactory knowledge on the pretest, the majority of them had appropriate knowledge after the video-assisted education intervention regarding cardiac arrhythmia and cardiac electrophysiology. According to the researcher, these findings supported the effectiveness of the video-assisted instruction that fulfilled the goals of the study.

These results are supported by a study by **Elsayed et al. (2019),** which discovered that most of the sample under study knew very little about atrial fibrillation, one of the most prevalent arrhythmias. Additionally, in the same vein, **Kupo** et al. (2020) found that the majority of the patients in their study have inadequate information about arrhythmia. However, the findings of the current study were in conflict with those of a study conducted by **Toscos et al. (2020**), which found that the majority of participants (more than half) had a medium level of expertise. According to the researcher, this outcome can be the result of the patient's lower educational attainment.

It was in line with the results of a study by Anderson et al. (2019), which found that over half of the sample had unsatisfactory knowledge of cardiac

electrophysiological experiments. Additionally, **Chang et al. (2021**) found that patients having cardiac electrophysiological studies required thorough instruction since they exhibited significant deficiencies in procedure-related information. The researcher believes that the lower educational level of the patient under study may be the cause of these findings.

According to the current study's findings, all knowledge items showed statistically significant gains and differences after a video-assisted teaching intervention about cardiac electrophysiology. The effectiveness of the video-assisted teaching intervention and the patient's motivation to increase their knowledge may be connected to that.

The current study indicated that, in terms of minor acute problems, less than one-fifth of the patients had bleeding, mild to moderate pericardial effusion, hematoma at the puncture site, and vascular injury (3 percent). This result is consistent with **Vasheghani et al. (2018**), who found that a high percentage of minor complications were hematoma at the puncture site, mild to moderate pericardial effusion, bleeding that did not require medical therapy and vascular damage. This study, however, conflicted with one by **Abdur Rehman et al. (2019**), which found that the greatest proportion of mild complications was pericardial effusion necessitating pericardiocentesis.

Regarding major complications, the present study found that 4% of the examined patients developed atrioventricular (AV) block, requiring pacemaker implantation, and 2% developed deep vein thrombosis (DVT), which is consistent with the findings of a study by **Nakamura et al. (2019),** which found that 2% of their study participants undergoing EPS developed AV block, and our results are consistent with the findings of the study by **Itoga et al. (2020**), which found that 2% of the patients under investigation had DVT.

The present study showed that patients receiving cardiac electrophysiology before and after the video-assisted education intervention differed statistically in a highly significant way. From the perspective of the researcher, this can have to do with the capacity to learn on one's own, get knowledge, and comprehend it.

Regarding the anxiety level of the patients undergoing cardiac electrophysiology, the study found that, before the implementation of the cardiac electrophysiology, over half of the study participants experienced severe anxiety; this percentage only dropped to 6% following the video-assisted teaching intervention, with a statistically significant difference between the two periods. According to the study, a high degree of anxiety before the procedure could be caused by several factors, including ignorance about cardiac electrophysiology, future uncertainty, fear of problems, and expectation of pain during the treatment.

According to **Moser (2019), Ketterer et al. (2021), and Nekouei et al. (2021**), many cardiac patients have elevated anxiety levels, which often peak following an acute cardiac event. These findings were comparable to those of these studies. Additionally, according to **Trotter et al. (2021),** anxiety levels peaked before the procedure and then sharply declined after it (P <.001). Furthermore, more than half of patients reported experiencing significant anxiety, with an initial episode anxiety level of 8 or above, according to El-**Medany & Grubb's (2019**) study on supraventricular tachycardia and catheter ablation: anxiety levels and patient perceptions.

The study found a statistically significant correlation between the patients' total anxiety scores before and after the video-assisted teaching intervention, as well as their total knowledge and practice. According to **Webster et al. (2022) and Estes et al. (2023**), experience can affect how they approach health assessments. While more seasoned patients will use their prior knowledge to inform decisions and direct assessment procedures, less seasoned patients may require direction in the absence of the more sophisticated clinical reasoning and critical thinking methods used by more seasoned patients. According to **Buzatto & Vicki Zanei (2020**), anxiety is also lessened when higher-quality information and more materials are offered.

Conclusion:

Based on the present study findings, it could be concluded that video-assisted teaching intervention had a positive effect on reducing state-trait anxiety levels and acute complications for arrhythmic patients undergoing cardiac electrophysiology.

Recommendations:

Based on the current study results, thefollowing recommendations are proposed:

- Create and implement nurse care guidelines for arrhythmia patients undergoing cardiac electrophysiological research.
- Before electrophysiology, patient care should routinely include individual psychological preparation.
- All cardiology departments should have written patient monitoring guidelines available in Arabic for

nurses to follow; these guidelines should be updated regularly.

- To help nursing staff identify patients' anxiety and support standardized clinical practice, standards of care and practice guidelines were developed, and formal anxiety assessment was included in these guidelines.
- To generalize the results, the current study will be reapplied with additional individuals in different parts of Egypt.

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