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*On my honor, I pledge that I have neither given nor received any unauthorized assistance on this paper. April 9, 2023.*

### Abstract

**Background:** At the present time, there are limited studies evaluating anxiety and perceived preparedness of men with erectile dysfunction scheduled to undergo penile injection training (ICI). However, several other studies evaluate the positive effects of preemptive patient education on patient anxiety and preparedness.

**Purpose:** The purpose of this quality improvement project was to evaluate the effects of anxiety people endure while pending medical procedure trainings such as ICI. It also aimed to assess common evidence-based interventions studied amongst several other practices attempting to alleviate anxiety induced symptoms and increase patient's preparedness for an invasive injection.

**Methods:** This project utilized a pre- and post- test survey design comparing anxiety and preparedness at baseline prior to the penile injection appointment and after the video intervention. The Pre- test survey was administered to the patient at home prior to the patient watching the video intervention. The intervention was a recorded video outlining the penile injection process from start to finish and was sent via patient portal once the pre- test survey was completed. Post- test surveys were then administered at time of visit upon watching the video intervention to assess anxiety and preparedness for the penile injection training appointment. Time spent face to face with patients comparing those who watched the video intervention and those who did not were also compared through patient EMAR.

**Findings:** A total of 78 participants who met inclusion criteria were identified and recruited prior their penile injection training. 58 participants completed the pre- and post- test survey using a validated Likert tool to assess anxiety and perceived preparedness. 20 men were excluded for incomplete data collection or failure to watch the video intervention. There was no decrease in anxiety before intervention and after, however the level of preparedness amongst individuals increased after the video. Additionally, time spent face to face with the provider decreased post video education.

**Conclusions:** Findings suggest a video intervention to prepare patients prior to their penile injection training visits have a clinical and statistical impact on men undergoing penile injection training. However, there is no conclusive evidence to support a video intervention's impact on patient anxiety prior to the ICI injection training.

**Key Words:** Procedure, Anxiety, Education, Preparedness, Penile

## **Background**

### **Scope of the Problem**

The American Urological Association (AUA) defines Erectile Dysfunction (ED) as the consistent or recurrent inability to attain and/or maintain penile erection sufficient for sexual satisfaction (Burnett et al., 2018). There are approximately thirty million men in the United States and one hundred fifty million men globally who suffer from ED (Burnett et al., 2018). The AUA recommends initial treatment of ED with a phosphodiesterase type 5 inhibitor (PDE5i) such as Viagra, Cialia, Levitra, or Stendra as first line therapy (Burnett et al., 2018). The AUA also recommends that men are educated on other treatment methods such as the use of a Vacuum device (VED) or penile pump, as well Intracavernosal Penile Injections (ICI) (Burnett et al., 2018).

Vasoactive ICI into the shaft of the penis is a second line option for ED (Bella et al., 2015). The Sexual Medicine Society of North America states ICI therapy, introduced in 1982, has become a well-established treatment for ED with a high rate of clinical efficacy (Nelson et al., 2013). ICI is a minimally invasive procedure used to dilate the cavernosal arteries in the penis and relax smooth muscle allowing for a natural erection (Stuehmeier et al., 2019). It is a procedure performed in the office with return demonstration in the presence of a Registered Nurse or Advanced Practice Provider.

According to the World Journal of Urology, ICI demonstrate efficacy in approximately 54-100% of patients (Duncan et al., 2019). However, there are high discontinuation rates (approximately 34%) within a few months of starting the injections (Duncan et al., 2019). A barrier to adequate ED treatment is the high correlation between anxiety and ICI (Duncan et al., 2019). Nelson et al. (2013) notes that despite several reports of patient anxiety related to penile injections, anxiety has rarely been assessed. While Mulhall et al., (2019) reports an anxiety rate

of only 5% due to fear of needles, men still report moderately high anxiety levels related to ICI (Nelson et al., 2013).

Often men self-report severe panic and anxiety prior to their training sessions. Anxiety relieving measures such as a proper education component prior to procedural appointments, may promote patient compliance, and improved satisfaction rates with injections. The goal of the injections is to improve quality of life (sexual function) by preventing penile atrophy. Exploring anxiety in men before their penile injection training may provide useful information.

### **Significance of Problem**

Despite knowledge and clinical experience that men become very anxious about penile injection therapy, anxiety has rarely been assessed in studies (Nelson et al, 2013).

### **Global**

Anxiety is a complex physiologic preparatory response to a potential negative event that has not commenced (Barlow, 2002). According to the International Journal of Surgery, pre procedural anxiety globally was among 48% (Abate et al., 2020). Pre procedural anxiety was approximately 4 times more likely in patients afraid of complications and noted to be a significant factor increasing post procedural pain, decreasing satisfaction, and hindering quality of life (Abate et al., 2020). While it is noted that the anxiety differed between certain age, genders, and type of procedures, a common theme of anxiety is the fear of unknown or intolerance of uncertainty (IU) (Abate et al., 2020).

The global pooled prevalence of preoperative anxiety among surgical patients was 48% (95% confidence interval (CI): 39–47%, 28 studies, 14,652 participants (Abate et al., 2020).

### **National**

According to the Journal of Vascular and Interventional Radiology, out of 1163 respondents, most described preprocedural anxiety as somewhat to very important in their practice (n = 961, 82.6%), somewhat to very important to the patients (n = 1087, 93.5%), and at least sometimes interfering with delivery of care (n = 815, 70.1%) (Musa et. al, 2020).

Several studies in the United States evaluate the lack of education as a cause of fear of impending procedures. Fitzgerald & Elder (2008) evaluated the effects anxiety by using an educational handout preoperatively. With the handout, 160 (41.3%) patients demonstrated a reduction in fear scores, with a 49.6% ( $p < 0.001$ ) reduction between mean final scores. (Fitzgerald & Elder, 2008). A cross sectional study evaluated by Nasser et. al (2021) on the causes of preoperative anxiety found that lack of pre procedural education was a main culprit. The survey evaluated 50 patients scheduled for a dermatologic procedure of which 82% of patients reported the fear of unknown was a primary indicator for their anxiety (Nasser et al., 2021).

### **Local**

Clinically, many men deny a “fear of needles” yet still report moderate to high anxiety related to starting ICI treatment (Nelson et al., 2013). A study completed at Memorial Sloan Kettering found that injection anxiety, on average, was moderately high (score = 5.7 on 0–10-point scale) at the first injection training. Nelson et. al 2013 found positive correlations between perception of pain with needles relative to anxiety (Nelson et al., 2013). Nelson et. al 2013 recommended the need for further interventions to help reduce anxiety related to ICI.

### **Problem Statement**

Pre-procedural patient education impacts patient outcomes. Ineffective pre-procedural patient education may result in debilitating anxiety, poor perceived preparation, and longer than

expected procedural visits. Nurse-led quality improvement projects are needed to improve pre-procedural patient education for men undergoing penile injection training.

### **Purpose**

The purpose of this quality improvement project was to develop, implement, and evaluate the effects of a video education program on the reduction of pre-procedural anxiety and increased perceived preparation in men undergoing Intracavernosal Penile Injection training.

### **Specific Aims**

The three specific aims of this project are to:

- Decrease anxiety related to common misconceptions of penile injections.
- Increase patient's preparation toward the use of penile injections using video- education platform.
- Decrease procedural appointment to 45 minutes in duration and evaluate the association between anxiety scores and time spent with patient in office.

### **Evidence to Support Intervention**

While many clinics prepare patients for future procedures, patients still wanted to receive more information (Ahmed et al., 2019). According to the Journal of Abnormal Psychology, perhaps the relationship between wanting more information despite an in-depth counseling session may be related to worriers showing more evidence of restricted capacity during time of worry (Hayes et al., 2008). Despite proper education, it is suggested that an increase in patients' procedural knowledge may cause a decrease in worry because of repetitive information (Mofrad et al.,2021).

An in-depth literature review included ten studies published from 2016-2022 that met inclusion see *Figure 1* (in appendix) which evaluate the quality and evidence of each study

using the Johns Hopkins level quality and grading criteria (Dearholt & Dang, 2017). Nine studies were quantitative, and one study was qualitative research. There was a combination of five randomized control studies Level I (Ay et al., 2021; Ayasarah & Ahmad, 2016; Habibzadeh et al., 2018; Lin et al., 2021; Mofrad et al., 2021), two prospective comparative Level II (Ahmed et. al, 2019; Esen et al., 2022), one randomized prospective study Level II (Cakmak et al., 2018), and two quasi experimental studies Level III (Ata et. al, 2020; Haddad et al., 2018).

Sample sizes of the studies ranged from 40-203 participants. The studies took place in the United Kingdom, United States, Jordan, Turkey, and Amsterdam. All ten studies combined adult patient's male and female, 18 years or older. Four common themes amongst the studies were the effect on anxiety and post procedural complications, patient satisfaction, inadequate evidence of standardized patient education techniques, and impact of patient knowledge, retention, and comprehension.

### **Translation Framework**

#### **Rosswurm and Larabee's Model for EBP**

Rosswurm and Larabee developed a six step EBP model in 1999 from the University of West Virginia (White et al., 2016). Although it was used primarily in hospitals, it is adaptable to ambulatory care clinics (White et al., 2016). The model is imperative to nursing because it relies on evidence and aims to avoid clinical bias (White et al., 2016).

The first step in the process is to assess the need for change (White et al., 2016). In the men's health practice, there are several complaints by patients regarding their poor preparation for ICI procedural sessions (Nelson et al., 2013). Patients state they use available media online to develop a general understanding of the procedure. However, there is no standardized education

system for ICI and therefore the procedure can be vastly different amongst other clinics. As the second component of the model linking the problem to an intervention, an educational component prior to patient's visit may be useful (White et al., 2016).

As discussed above, anxiety in men undergoing ICI is poorly studied (Nelson et al., 2013). However, there is vast data expressing the need for patient education and a standardized system to reduce anxiety in patient's undergoing localized procedures. As part of the models third aim, gathering the evidence is paramount (White et al., 2016). An in-depth review of the literature evaluated the following databases PUBMED, CINAHL, EMBASE, and PSYCHinfo. Additional findings included the Journal of Abnormal Psychology, which recognized a relationship between patients wanting more information despite an in-depth counseling session, which may be related to worriers showing more evidence of restricted capacity during time of worry (Hayes et al., 2008). Despite proper education, it is suggested that an increase in patients' procedural knowledge may cause a decrease in worry because of repetitive information (Mofrad et al., 2021). Additionally, procedures are complex and often difficult for patients to comprehend (Lin et al., 2021). Patients with a high level of anxiety require repetition of explanation in detail (Ayasrah & Ahmad, 2016; Mofred et al., 2021).

The fourth step of the model is to design a practice change as the evidence may be generalizable (White et al., 2016). Since repetition can decrease worry, a video education seminar will be recorded to provide patients with information prior to their training sessions (Mofrad et al., 2021). Step five is to implement and evaluate the change in practice (White et al., 2016), which will be evaluated by a ten-point validated Anxiety Likert tool pre and posttest survey (Nelson et al., 2013). Comparing the surveys will provide data if the video education session is effective at reducing patient anxiety. If effective, and clinically significant (regardless



of statistical significance) the sixth aim of the model is to integrate the change into daily practice (White et al., 2016). Perhaps the patient can have the video available to reference after their training session as well to review techniques and encourage repetition.

## **Methods**

### **Design**

This project is a prospective study that will utilize a pre-test/post-test design method. The project will include a previously published and validated Anxiety Likert scale ranked from 0 (no anxiety) to 10 (most anxiety) to gather information on participants (Nelson et. al, 2013). It will also include a validated 5-point Likert scale which looked at patient satisfaction, to evaluate patient's perception of preparation for ICI training, 0 (not prepared at all), to 5 (extremely prepared (Cakmak et al., 2016).

To evaluate the time spent with patients, patients "room in" (when patient is placed inside exam room) and room out times (when patient exits exam room) will be monitored and recorded in EPIC.

Originally patients were scheduled for two thirty-minute injection visits. At the first visit, an Advanced Practice Provider injected the patient with a penile injection to capture a baseline analysis of the patient's response and tolerance to the medication. The patient would then present for a second visit within the month to return demonstrate and have a thorough education session on safety and use of the injections which could take up to 90 minutes in duration. For feasibility of data collection, patient preference for one visit, and a pilot of practice change, the patients will be scheduled for a 60-minute combined session after watching the injection video where they will return demonstrate the penile injection in only one session. This was an amendment to clinical practice guidelines for the purpose of the quality improvement analysis.

**Setting**

An ambulatory men's sexual medicine health clinic located in a large oncology academic institution on the east coast. The institution offers a variety of cancer related treatments including medical, surgical, radiotherapy, and quality of life management for patients during and post oncological intervention. The men's sexual medicine department is one of the largest departments in the institution, serving primarily those who have had sexual complications secondary to cancer related treatments.

**Sample**

The sample chosen will be a convenience sample that includes all men greater than 18 years or older with a median age of 60 that present to clinic having failed primary treatment for ED with the use of oral PDE5 inhibitors. Adolescents who suffer from ED will be excluded. Additionally, male patients who require retraining or those already trained in ICI at an outside facility will also be excluded.

**Sample Size**

A G power analysis was utilized to determine appropriate sample size of 30 patients to achieve statistical significance. Due to employee constraints with sick calls from Covid and Family Medical Leave, this may have implications on the exact sample size.

**Ethical Review Approval Plan****Participant Recruitment**

The lead investigator will review two Advanced Practice Provider's (including their own) appointment schedule weekly to evaluate patients scheduled for a 60-minute ICI procedural training. Once a patient is identified he will be sent a pre-test questionnaire via HIPPA regulated patient portal to evaluate his anxiety and perceived preparation related to the ICI procedure.

**Intervention Procedures***Sequence and Timing*

The intervention will occur over a 12-week period. Patients will be screened for ICI training appointments prior to their visits. As per standard practice prior to the procedure, the patient will also be supplied with an in-depth booklet explaining the procedure of ICI. They are instructed to read the booklet prior to their appointment. Once a patient is identified for the study, he will be instructed to sign up for the patient portal for easy HIPPA regulated email access. The patient will then be guided to answer a ten-point Likert survey based on the Anxiety Inventory Scale which is utilized to evaluate physiological anxiety and the response to injections (Nelson et al., 2013). The Anxiety Inventory scale was originally used to assess patients with multiple sclerosis undergoing in office injections (Nelson et al., 2013). Modifications will be used as the literature is reviewed and to ensure relativity to the sample of patients.

The patient will also be instructed to answer a five- point Likert survey to evaluate the patient's perception of preparation prior to their procedural training visit. This tool is based on a previously published Likert scale evaluating patient satisfaction (Cakmak et al.,2016).

After the pretest surveys are completed and received by the clinical team, the patient will be given a link to watch the pre-recorded ICI video with instructions to watch before attending their training session. No discussion of anxiety will be mentioned in the video. Once the patient has viewed the video, they will present to their sixty-minute injection training session as scheduled. They will be given the same post-test Likert survey to evaluate their anxiety and preparation for training. A de identified excel spreadsheet will be used to monitor the results of patient surveys.

### **Data Collection and Instruments**

A video script will be written, recorded, and evaluated by the project site's patient education department. Baseline data will be collected by participants one week prior to their scheduled injection training visit. Two validated and reliable pre-test Likert Anxiety survey will

be sent to the patient via the patient portal system. First patients will be asked to rate their anxiety from 0 (no anxiety) to 10 (maximum anxiety) (Nelson et al., 2013). The survey will also include an additional five-point Likert to evaluate the patient's perception of preparation prior to their procedure (Cakmak et al., 2016).

Once the pre-test is filled out, patients will then be sent a link to watch the educational training video. Individual patient assessments will be tracked using the last four digits of their medical record and recorded in an excel spreadsheet for pre-test monitoring. To assess feasibility of the project, once the patient arrives for their scheduled procedure, provided they watched the video, they will be given a posttest Likert scales. This will be recorded in the excel spreadsheet as post-test results. Mean changes in anxiety and perceived preparation scores will be compared for evaluation of statistical significance. Mean time of patient spent in the room with provider will also be assessed and compared with those who did or did not watch the video intervention.

### **Data Analysis Plan**

Data will be analyzed using SPSS version 28. Descriptive statistics will be utilized to address participants age and demographics.

*Aim 1: Decrease anxiety related to common misconceptions of penile injections.*

For Aim 1 to decrease anxiety related to common misconceptions of penile injections, I will use a pre-test post-test design with a dependent variable anxiety that is normally distributed and a sample size greater than or equal to 30. Mean differences will be calculated for both pre and posttest. Therefore, this aim will be analyzed using a paired t-test. I will report the p-value to determine statistical significance and the means and standard deviations to interpret the direction of the relationship.

*Aim 2: Increase patient's perceived preparation toward the use of penile injections using video-education platform.*

For Aim 2 to increase patient's perceived preparation for the procedural appointment, I will use a pre-test post-test design with a dependent variable preparedness that is normally distributed and a sample size greater than or equal to 30. Mean differences will be calculated for both pre and posttest. Therefore, this aim will be analyzed using a paired t-test. I will report the p-value to determine statistical significance and the means and standard deviations to interpret the direction of the relationship.

*Aim 3: Decrease procedural appointment to 45 minutes.*

For Aim 3 I will calculate mean times of each appointments including Room in Time and Room out Time for those who watched the video intervention compared to patients who did not. I will report the p-value to determine statistical significance and the means and standard deviations to interpret the direction of the relationship.

### **Discussion:**

The main purpose of this study was to evaluate if a video education intervention would decrease anxiety in men prior to undergoing penile injection training. Evidence supports that many men who think about penile injections become very anxious (Nelson et al., 2013). While Nelson et al., (2013) discovered knowledge correlating adherence of penile injection therapy and anxiety, there remains a large gap in the literature about interventions to alleviate the anxiety men suffer. Additionally, as a procedure that by institution standards should take 60 minutes face to face with a provider, had an average training time of 60-90 minutes. Cakmak et al.,

(2018); Lin et al., (2021); and Mofrad et al., (2021) argue that complex procedures are difficult for patients to comprehend, and a patient's retention and recall of a medical consultation is usually inadequate. According to Kessels (2003), between 40-80% of medical knowledge is forgotten almost immediately after provided. Since the visits are long and many of the patients are anxious, they are unable to grasp the full 60-minute session. This also prevents the provider from treating more patients throughout the day while causing large waiting room times.

A quality improvement study using a video education platform to explain the process and demonstrate a penile injection was created for patients prior to their visits. The aim was to decrease anxiety, increase perceived preparation, and reduce time spent face to face with a provider. Finding ways to reduce anxiety and educate people ahead of their visit could minimize face to face education with a clinician as the patient may retain more. This may allow for more patient visits throughout the day, additional billable hours, and increased patient satisfaction.

## **Results**

As seen from the data, anxiety did not decrease and perhaps increased. During the appointment, patients stated they became more apprehensive after they watched the video at home. Some patients stated they watched it three or four times, others said they could hardly get through the first three minutes without having a panic attack. Many patients believed the reduction of anxiety occurred only after the exposure to the injection. Further data will be useful to examine causes of anxiety and penile injections.

While the impact of the video on anxiety was not statistically significant, people acknowledged feeling more prepared for their visit and ready to inject on arrival. This was found to be clinically and statistically significant. Additionally, when comparing the means, an average

of 5 additional minutes was saved face to face per patient. With a total of 10 patients seen per day, that is 55 billable minutes that could be allotted to an additional patient and/or other productive work in the office.

This data encouraged a practice change. We adjusted our 60-minute visit into two separates 30-minute visits. At the first visit, a provider will briefly explain the penile injection, show patient how to inject, and then proceed to inject the patient. The patient is then instructed to watch the video prior to their second appointment. At the second appointment, the patient will return demonstrate the penile injection by injecting themselves. Once this is completed, the provider will educate the patient how to safely use the injections at home. The two 30-minute visits seem to have improved patient satisfaction, increase revenue for the institution, and enhance quality of patient care. Additional studies will need to be collected to evaluate if this intervention is effective.

Limitations of the study were mainly related to staffing. The office had several different clinical coordinators unfamiliar with the project. Therefore, when the lead investigator was offsite, approximately 10 patients did not receive the follow up survey. Additionally, room in and room out times were not accurately assessed for approximately ten patients. Therefore, there was incomplete data, and twenty patients were excluded post data collection. There is also a major gap of data analysis on the topic of penile injections and anxiety. Therefore, more studies would need to be evaluated to generalize results. However, this study presents as a steppingstone to improve anxiety in men undergoing penile injection training.

**Dissemination and Sustainability:**

Findings from this study were presented to key stakeholders including nursing management, advanced practice provider management, the institution's quality improvement committee, and the director of the Sexual Medicine Program at the ambulatory care clinic where the project was implemented. Steps have been taken to adapt guidelines and integrate a new program into clinical practice. Findings were submitted via power point presentation to the hospital's quality improvement strategy committee. Additionally, future abstract presentation at the American Urological Association and Sexual Medicine Society of North America will be considered. Results of the project have been developed into manuscript which will be submitted for publication in the Sexual Medicine Journal of Urology.

To facilitate the practice changes, there are necessary steps to improve intracavernosal injection training process. Since the visits have been shortened to two thirty-minute appointments, patients will need to show up to the appointment early or on time to be prepared to start at time of the appointment. It is key for the office coordinators to ensure patients are aware that showing up 15 minutes earlier to their appointment time is paramount to the success of the teaching. Also, the clinical coordinators responsible for sending the video education in between appointments will need to be encouraged to ensure the patient receives education ahead of the second appointment.

### **Conclusion:**

**Despite knowledge and clinical experience that men with erectile dysfunction become very anxious about penile injection therapy, anxiety has rarely been assessed in studies (Nelson et al, 2013).** The study's purpose was to provide men with a video education platform to educate patients prior to their penile injection training with the aim of decreasing pre



procedural anxiety. Significant improvement in patient comprehension and preparedness was evaluated prior to their injection training with the use of a formal video education platform.

Despite lack of statistical significance related to anxiety, time spent face to face with the provider decreased after exposure to the video education. Positive participant evaluation and stakeholder adherence indicates feasibility of long-term implementation. This project highlights the importance of understanding the root cause analysis of anxiety and penile injections. This study highlights the importance of future assessment and intervention to decrease the anxiety men feel prior to undergoing penile injection training.

## Appendix

### Translation Framework

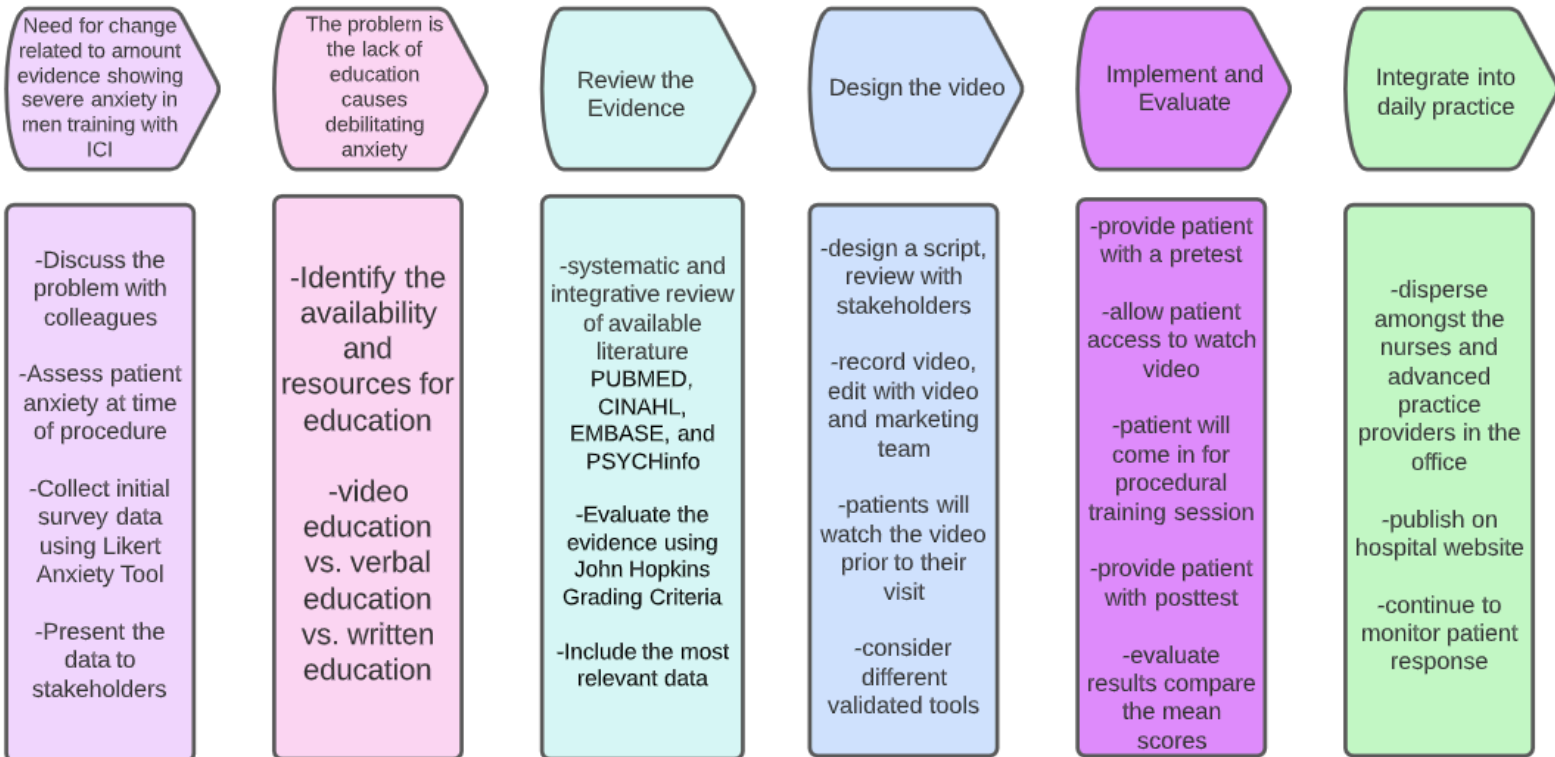
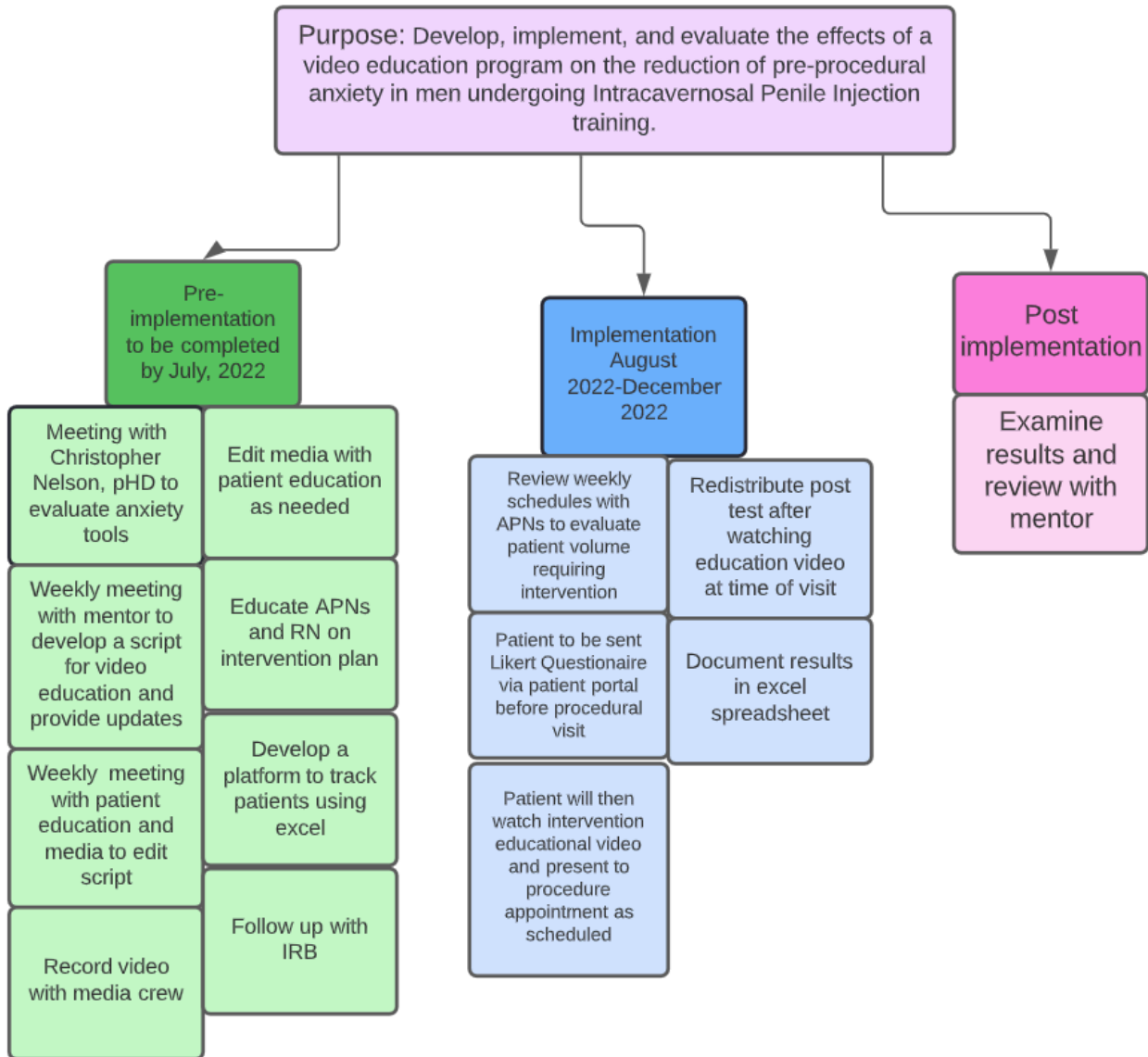


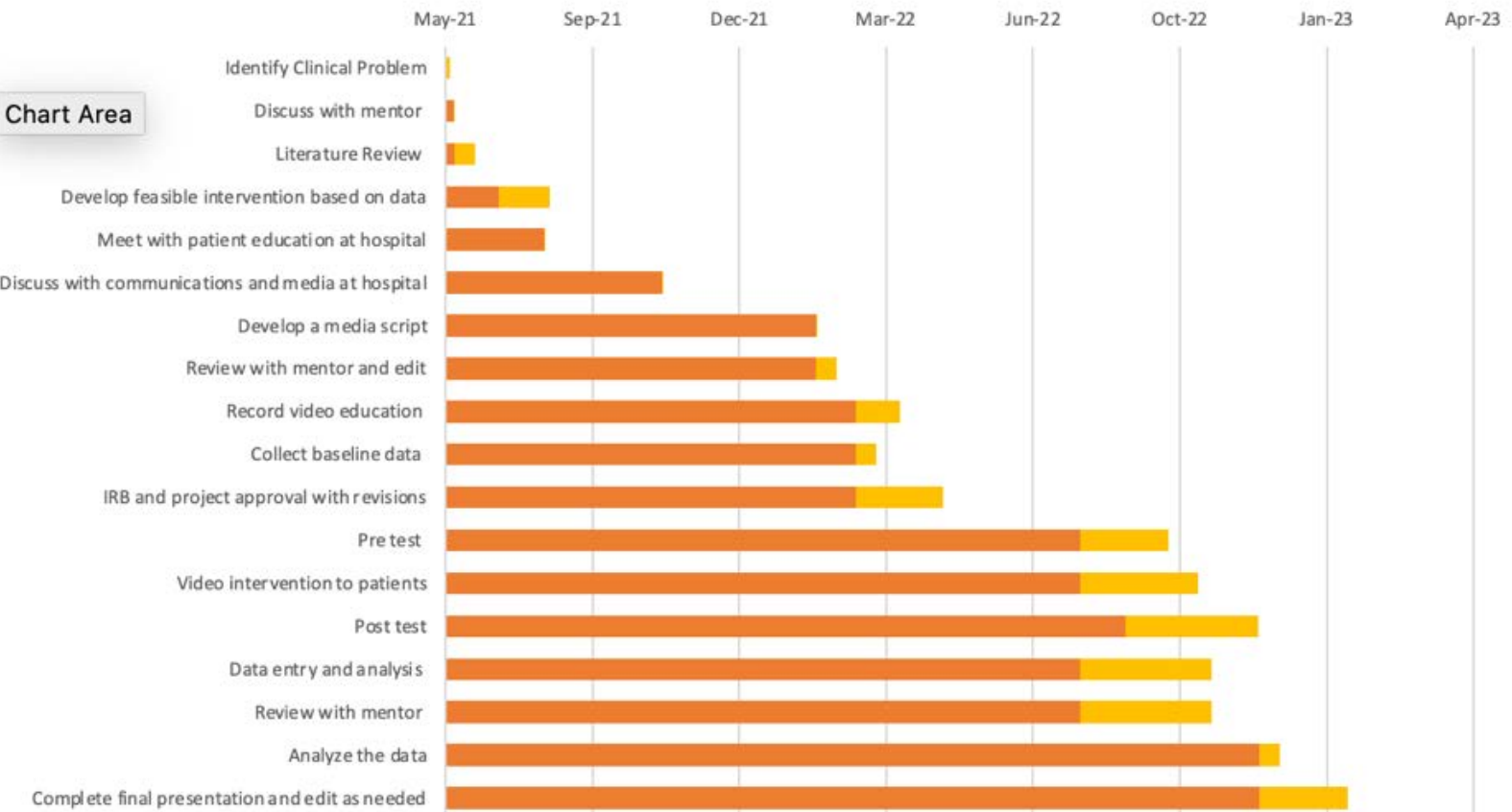
Figure 1 Rosswurm and Larrabee’s Model for EBP Change for anxiety in men undergoing penile injection training (White et al., 2016)

**Work Breakdown Structure**



**Gantt Chart**

**GANTT CHART**



	Complete final presentation and edit as needed	Analyze the data	Review with mentor	Data entry and analysis	Post test	Video intervention to patients	Pre test	IRB and project approval with revisions	Collect baseline data	Record video education	Review with mentor and edit	Develop a media script	Discuss with communications and media at hospital	Meet with patient education at hospital	Develop feasible intervention based on data	Literature Review	Discuss with mentor	Identify Clinical Problem
Start Date	12/1/22	12/1/22	8/1/22	8/1/22	9/1/22	8/1/22	8/1/22	3/1/22	Mar-22	3/1/22	2/2/22	2/2/22	10/20/21	8/1/21	7/1/21	6/1/21	May-21	May-21
Days to complete	60	14	90	90	90	80	60	60	14	30	14	1	1	1	35	14	1	3

**Stakeholder Analysis**

**SWOT analysis**

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>-Cohesive team of Advanced Practice Providers (APP) and Physicians with willingness for quality improvement</li> <li>-Strong leadership support from institution</li> <li>-Unlimited resources from media and education department</li> <li>-Published mentors with a wealth of knowledge willing to assist</li> <li>-Need for improving patient outcomes and changing current standard of practice</li> <li>-Ease of availability to discuss project requests with institution stakeholders</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>-High employee APN turnover requiring continuous education and further buy in on project</li> <li>-Highly competitive hospital for QI projects</li> <li>-Mentor with limited availability due to time constraints related to personal/business travel</li> </ul>
<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>-Continuous employee turnover</li> <li>-Employees going on vacation or FMLA will reduce the sample size since providers will be unable to see more patients</li> <li>-APP's forgetful documentation and collecting data as it is one additional step to workflow</li> <li>-Video is not edited and implemented on time</li> </ul>	<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>-Reduce patient anxiety by evaluating standard mean scores</li> <li>-Improve patient perceived perception of penile injections <ul style="list-style-type: none"> <li>-Improve patient satisfaction</li> </ul> </li> <li>-Decrease F2F encounters with patients from 90 minutes to 45 minutes</li> <li>-Increase hospital revenue by seeing more patients daily</li> <li>-Publicize video to all patients undergoing ICI so they can utilize video at any time <ul style="list-style-type: none"> <li>-Decrease call volume with redundant questions</li> </ul> </li> </ul>

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**Appendices with Instruments, Protocols, Algorithms etc. (Use one page per item)**



Figure 1: PRISMA flow diagram of article search. Please see below for inclusion and exclusion criteria and articles reviewed.

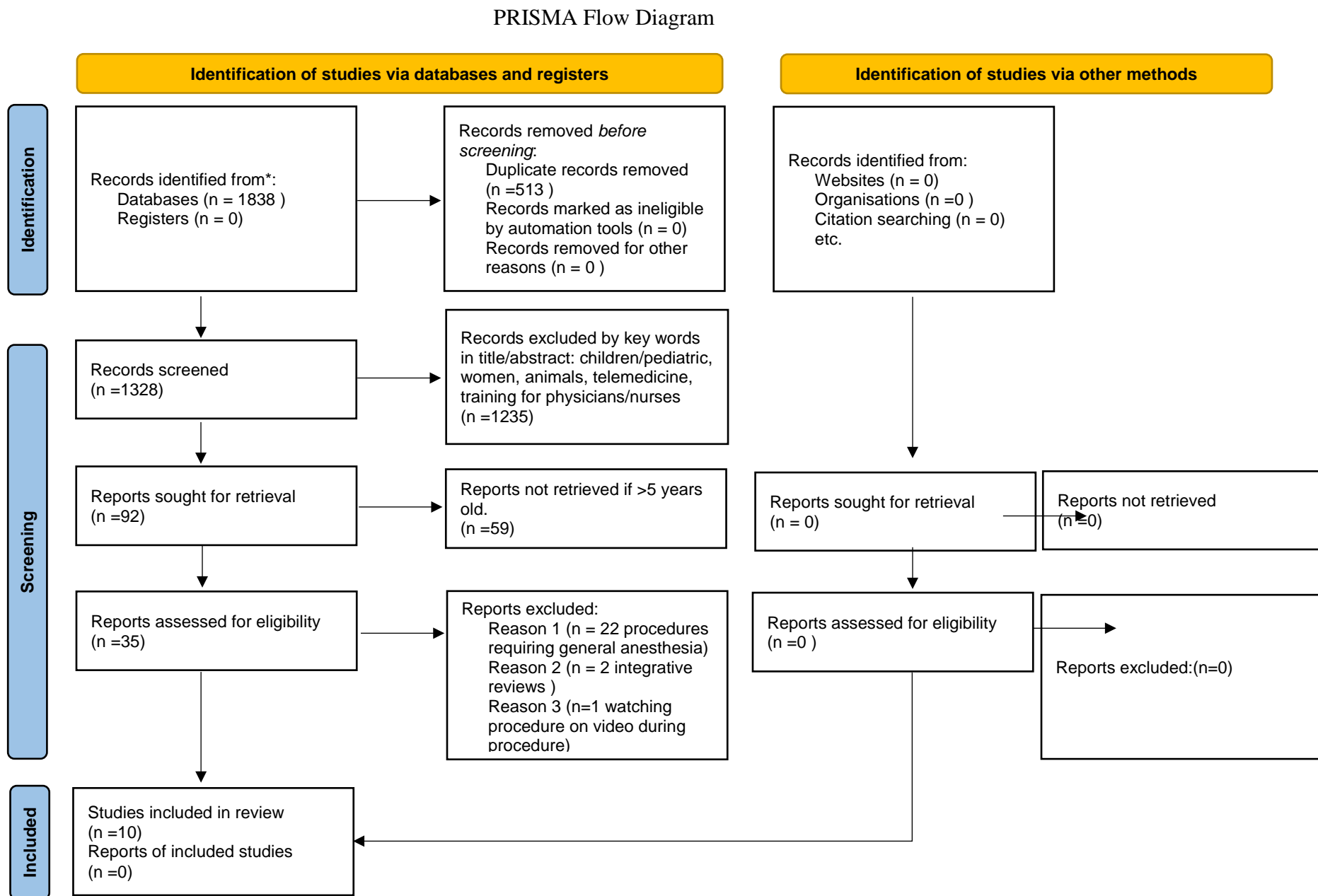




Table of Evidence

Table 1

Article Number	Author and Date	Evidence Type	Sample, Sample Size, Setting	Findings That Help Answer the EBP Question	Observable Measures	Limitations	Evidence Level, Quality
1.	Ahmed, Ki., Pilling, J., Ahmed, Kh., Buchan, J. (2019)	Prospective comparative study	N= 200 patients first elective cataract surgery n=100 control group had not seen video n=100 intervention group shown video preprocedural on the day of the cataract surgery Hospital in United Kingdom	A brief educational video increases patient's knowledge of Mohs surgery. For patients who have not yet had a consultation with a Mohs surgeon, the video may also reduce anxiety.	-Amsterdam Preoperative Anxiety and Information Score (APAIS), - 80.0 mm <a href="#">visual analogue scale measuring anxiety</a> (VAS) score.	-did not exclude or ascertain whether patients had a spouse or close relative who had undergone surgery; nor did we determine patients' level of experience of previous ophthalmologic or nonophthalmologic operations  -educational level and occupational background of the patients was not recorded. -not randomized, selection bias	Level II, Quality B
2.	Ata, N., Alatas, N., Gulluev, M., Yilmaz, E. (2020)	Prospective Quasi Experimental, Nonrandomized control trial	N= 85 patients 40 cases received video assisted education 45 cases received face to face education Tertiary academic Medical Center, Turkey	Video assisted education prior to intratympanic steroid injection had no superiority in reducing anxiety compared to face-to-face verbal education	-the Visual Analog Scale (VAS) measuring anxiety  -Spielberger State-Trait Anxiety Inventory (STAI).	-Native language of all the patients/physicians was Turkish. -Since video education is uniform, cannot adjust based on educational levels -trust in the physician who is giving the information and	Level II, Quality A

						doing the procedure. The patients trusted the physician and met them prior to education and procedure.	
3.	Ay, S., Ata, N., Oncu, F. (2021).	Prospective Randomized study	N=50 Two groups n=25 group 1 received written information n=25 group 2 receive written and video based education Department of General Surgery, Turkey	The video based information provided prior to thyroid biopsy draws the attention as an effective and easy to apply method to decrease the anxiety of the patients.	-Baseline anxiety using STAI-S and STAI-T questionnaire s.  -After the written information was provided to the patients in group 1, the STAI-S questionnaire was repeated. In the same way, group 2 patients  -All patients were asked to evaluate pain during biopsy using visual analog scale (VAS).	-there was no questionnaire about whether the patients understood the information given after the informing procedure.  -hemodynamic data were not recorded to measure patients' anxiety	Level I, Quality B
4.	Ayasarah, S.M., Ahmad, M. (2016)	Randomized Control Study	N=182 patients undergoing cardiac cath n=91 The intervention group received the education session and materials in Arabic by the principal investigator	After video education, there was a significant difference in periprocedu ral perceived anxiety between the groups: preprocedur al anxiety levels	-vital signs were used to assess anxiety levels  -Spielberger's State-Anxiety Inventory (SAI) that is a subscale of the State Trait Anxiety Inventory	-Results should be read with caution, especially for patients who were taking antihypertensiv e medication	Level I, Quality B

			n=91 The control group patients received information on a CATH procedure through brief verbal instructions from nurses and cardiologists				
			Royal Medical Services, Jordan				
5.	Cakmak, M., Kose, I., Zinzircioglu, C., Karaman, Y., Tekgul, Z., Petkas, S, Balik, Y., Gonollu, M., Bozkurt, P. (2018)	Randomized Prospective study	N=198 patients 100 cases in group 1 received written, verbal, and video-based education 98 cases in group 2 received verbal and written education Turkey	Providing video-based information during the preanesthetic interview alleviated anxiety and increased satisfaction in patients undergoing spinal anesthesia.	-The State-Trait Anxiety Inventory (State-Trait Anxiety Inventory/State and State-Trait Anxiety Inventory/Trait) questionnaire -visual analog scale (VAS) measuring anxiety - A 5-point Likert scale was used to measure satisfaction during postoperative period.	-Presumed spinal anesthesia would increase patient anxiety pre-operatively. - Misconceptions and misunderstandings may contribute to fears related to anesthesia. -patients' attitudes toward spinal anesthesia are not scientifically proven in Turkey - use of a more sophisticated information method, such as video-based education, does not guarantee that the patient retains the message	Level II, Quality B

						<p>-no demographic and non-demographic variables were related with this reduction in anxiety.                  -Factors affecting anxiety may differ among countries and cultures</p>	
6.	<p>Esen, C.S.B., Yazici, G., Hurmuz, P., Gokhan, O., Faruk, Z. (2022).</p>	<p>Prospective simple randomization</p>	<p>N=40 vs. intervention groups with a video-based intervention with a video based education</p>	<p>Pre procedural survey before receiving any information about the treatment. The patients in group 1 received only one-to-one information sessions and the patients in group 2 received one-to-one information sessions and video-based education after completing the survey. Then, all patients again completed the survey before the treatment.</p>	<p>-The State-Trait Anxiety Inventory (State-Trait Anxiety Inventory/State and State-Trait Anxiety Inventory/Trait) questionnaire                  -The patients were also asked to report their anxiety levels using the visual facial anxiety scale (VFAS).</p>	<p>-random assignment to groups without randomization tool                  -trend toward increasing the set up time in patients who did not receive video based education which did not reach statistical significance</p>	<p>Level II, Quality B</p>

7.	Haddad, N., Saleh, M., Eshah, N. (2018)	Quasi experimental qualitative	N=95 Comparison vs. intervention groups with a video-based intervention about percutaneous coronary procedure Queen Alia Heart Institute, Jordan	A pre procedure nurse-led educational intervention provided by video had a significant effect on reducing anxiety levels among patients undergoing percutaneous coronary intervention	- The State Anxiety Inventory was used to measure anxiety levels at baseline, 2 hours before, and 4 to 6 hours after a percutaneous coronary intervention	-one of only few studies in Jordan that evaluate the effectiveness of nurse-led video-based education on anxiety -study was conducted on outpatient patients only -Arabic speaking only without hearing or visual disabilities -majority of patients were not highly educated	Level III, Quality B
8.	Habibzadeh, H., Milan, Z., Radfar, M., Alilu, L., Cund, A. (2018)	Single blinded Randomized Control study	N=120 Block Randomization method assigned to 4 groups n=30 peer education group n=30 video education group n=30 combined peer and video education group n=30 control group (no education) Two large educational hospitals in Iran	peer-and-video education were effective in reducing angiography-related patient anxiety	-A Persian-language validated version of the State-Trait Anxiety Inventory was used to measure pre- and post-intervention anxiety.	- inconsistencies in the length of time between the training and the procedure might affect the generalizability of the findings.  -In order to avoid data contamination and researcher bias, patients in the current study were recruited in staggered phases, with new participants recruited only after all those involved in the previous intervention had been discharged.	Level I, Quality B

						-physiological variations among patients were not investigated.	
9.	Lin, M., Dubin, D., Younessi, S., Khorasani, H. (2021)	Prospective, blinded randomized controlled trial	N=120 patients before 1 <sup>st</sup> Moh's surgery n= 60 individuals watched an instructional video n= 60 no audiovisual Icahn School of Medicine at Mt. Sinai, United States of America	A brief educational video increases patient's knowledge of Mohs surgery. For patients who have not yet had a consultation with a Mohs surgeon, the video may also reduce anxiety.	-A 13-question survey was administered to both groups measured patient's knowledge (knowledge quiz scores out of 9 based on Q.4–12 of the survey),  -patient's anxiety (VAS), and patient's understanding (the visual analogue score) of Mohs surgery.	-small sample size, difficult to issue a generalize -25% refused to take part in study introducing potential selection bias -available only in English, difficult to evaluate non-English-speaking populations -knowledge retention was not evaluated -did not explore other sources of information that can affect patient's knowledge -video was available on the internet so patients in the control group may have viewed it	Level I, Quality C
10.	Mofrad, R.B., Frujtier, A.D., Visser, L., Hoogland, N., Dijk, M.V., Rossum, F.V., Smets, E.M., Teunissin, C.E.,	Randomized Control Trial	N=203 Randomized into 3 groups n=63 educational video viewed at home n=70 in clinic video education n=74 control	evaluate the impact of a 3-minute educational animation-video explaining the LP procedure, on patients' knowledge, uncertainty, anxiety, and post-LP	- Mishel Uncertainty in Illness Scale (MUIS ) -State anxiety levels were assessed using a Dutch six-item version of the State-	-the baseline questionnaire had to be filled in online, which may be more difficult for individuals with cognitive impairment. - this was a single-center study in a tertiary memory clinic, resulting	Level I, Quality B



	Flier, W.M. (2021)		“care as usual” Alzheimer Center, Amsterdam	complications.	Trait Anxiety Inventory four-point Likert scale ranging from 1 = not at all to 4 = very much so. -Visual Analog Scale measuring anxiety	in a relatively highly educated and young population. Particularly the young and highly educated patients were most likely to benefit from the intervention.  - inclusion was terminated prematurely due to SARS-CoV-2, the coronavirus that caused the COVID-19 pandemic. <sup>35</sup> This resulted in a somewhat smaller sample size and may have led to loss of power, particularly with respect to the post-LP complications analysis.	
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Table 2

Date of Search	Search Engine	Search Terms	Retrieved Citations
09/19/2021	PubMed	((“Injections”[Mesh] OR inject*[tiab] OR “percutaneous”[tiab] OR “syringe”[tiab] OR “procedure”[tiab]) AND (“Anxiety”[Mesh] OR anxiety*[tiab] OR “anxious”[tiab] OR “psychosocial”[tiab] OR “emotional”[tiab] OR comfort*[tiab]) AND (“Audiovisual Aids”[Mesh] OR “Video Recording”[Mesh] OR “visual”[tiab] OR video*[tiab] OR teach*[tiab] OR “training”[tiab] OR “guidance”[tiab]) AND (educat*[tiab] OR information*[tiab] OR “knowledge”[tiab])) AND (Score*[tiab] OR level*[tiab] OR experience*[tiab] OR	428

		“satisfaction”[tiab]) AND (“Penis”[Mesh] OR “penile”[tiab] OR “penis”[tiab] OR erect*[tiab] OR “pelvic”[tiab] OR “pelvis”[tiab] OR “phallus”[tiab] OR patient*[tiab]) AND english[Filter]))	
09/19/2021	CINANL (EBSCO)	((MH "Injections+") OR inject* OR “percutaneous” OR “syringe” OR “procedure”) AND ((MH "Anxiety+") OR anxiety* OR “anxious” OR “psychosocial” OR “emotional” OR comfort*) AND (((MH "Audiovisuals+") OR (MH "Videorecording+") OR “visual” OR video* OR teach* OR “training” OR “guidance”) AND (educat* OR information* OR “knowledge”)) AND (Score* OR level* OR experience* OR “satisfaction”) AND ((MH "Penis+") OR "penile" OR “penis” OR erect* OR “pelvic” OR “pelvis” OR “phallus” OR patient*)	433
09/19/2021	EMBASE (Elsevier)	((‘injection’/exp OR inject*:ti,ab OR “percutaneous”:ti,ab OR “syringe”:ti,ab OR “procedure”:ti,ab) AND (‘anxiety’/exp OR anxiety*:ti,ab OR “anxious”:ti,ab OR “psychosocial”:ti,ab OR “emotional”:ti,ab OR comfort*:ti,ab) AND ((‘audiovisual aid’/exp OR ‘videorecording’/exp OR “visual”:ti,ab OR video*:ti,ab OR teach*:ti,ab OR “training”:ti,ab OR “guidance”:ti,ab) AND (educat*:ti,ab OR information*:ti,ab OR “knowledge”:ti,ab)) AND (Score*:ti,ab OR level*:ti,ab OR experience*:ti,ab OR “satisfaction”:ti,ab) AND (‘penis’/exp OR “penile”:ti,ab OR “penis”:ti,ab OR erect*:ti,ab OR “pelvic”:ti,ab OR “pelvis”:ti,ab OR “phallus”:ti,ab OR patient*:ti,ab) AND [english]/lim)	865
09/19/2021	PsycINFO (OVID)	((exp Injections/ OR inject* OR "percutaneous" OR "syringe" OR "procedure") AND (exp Anxiety/ OR anxiety* OR "anxious" OR "psychosocial" OR "emotional" OR comfort*) AND ((exp Audiovisual Instruction/ OR exp Videotapes/ OR "visual" OR video* OR teach* OR "training" OR "guidance") AND (educat* OR information* OR "knowledge")) AND (Score* OR level* OR experience* OR "satisfaction") AND (exp Penis/ OR "penile" OR "penis" OR erect* OR "pelvic" OR "pelvis" OR "phallus" OR patient*))	115

