



## ORIGINAL ARTICLE

## Ophthalmology Webinars Have the Potential to Enhance the Knowledge of the Participants and Change their Attitude About PANIS Method

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### Abstract

**Purpose:** We have previously presented Plasma-Assisted Noninvasive Surgery (PANIS) as an effective method in managing ocular surface disorders (OSDs). In this study we tried to evaluate the impact of our cobinar (Conference + Webinar) about PANIS method on ophthalmologists either in-person or online.

**Methods:** This study was designed as a quasi-experimental evaluation including a pre-/post-test investigation, conducting on 53 ophthalmologists. The participants were asked to complete a questionnaire provided by the authors including 14 questions before and after the cobinar.

**Results:** The cobinar had a positive effect on the participants' knowledge about the topics, however this increase (11%) was significant only among participants who didn't attend previously. The results indicated that the enthusiasm of the participants on use of PANIS method as their first line of treatment of OSDs or periorbital lesions was increased.

**Conclusion:** The results showed that ophthalmology cobinars have the potential to enhance the knowledge of the participants as well as changing their attitude about a certain subject. Our results revealed that online education can serve as an effective method to transfer the knowledge and also has an impact on attitude of ophthalmologists to use new methods in the arena.

### Keywords

Ophthalmology, Online education, Conference, Ocular surface disorders, PANIS method

but also damaged the social and economic aspects of the nations. Despite the enormous developments of education globally at all levels, the pandemic situation resulted in the most serious challenge of the education systems. Thus, remotely teaching, online education, and learning came in handy to overcome the challenges. Synchronous online seminars, known as webinars, are online events where at least one peer delivers a lecture-based presentation to the participants in order to improve perceived confidence and knowledge [1]. As webinars provide opportunities to take part from different geographic areas, reducing costs and time and guarantee safety, they offer more advantages over in-person presentations, especially during the COVID-19 pandemic. The studies revealed that webinars are usually well accepted by the participants [2] and also, they can be equally satisfied and effective for learning in comparison with traditional face-to-face learning [3].

Lifestyle in the current century and depending on more electronic devices and an aging population are impacting the number of individuals involved with eye disorders. Various forms of ocular disorders have made 25% of the human population suffer worldwide [4]. Therefore, it is critical to find an appropriate diagnosis to choose an effective intervention for ocular diseases. Ocular surface disorders (OSDs) including dry eye disease (DED) are among the most frequent eye disease globally. For instance, 25% of patients visited in ophthalmic clinics indicate symptoms of DED [5]. There are several factors that may cause a broad spectrum of

### Introduction

COVID-19 has emerged as the most concerning crisis of this century that threatens not only public health



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disease or injury resulting in ocular morbidities. These situations not only impact the quality of life among the patients but also impose a big burden on public healthcare.

Managing eye diseases have been traditionally performed by using honey and aloe vera for centuries and followed by conventional methods from using pharmaceuticals to invasive surgeries [6]. Today new strategies based on taking advantage of chemical compounds such as nanoparticles [7] and physical methods such as plasma [8] are providing new horizons. In all fields of medicine, treatments are willing to be safer, with less danger and complication in addition to their efficacy. Plasma is among emerging treatment strategies that has gained much attention for biological and medical applications in the last decades. Sterilization, wound healing, tissue or cellular removal, cancer therapy, and dental and cosmetic applications are major usage of plasma in medicine [9]. Plasma is considered as the fourth fundamental states of the matter which doesn't exist in nature and is only artificially generated by a neutral gas that undergoes heating or subjecting a strong electromagnetic field [10,11]. Even though the physics governing such generation has been elucidated, many of the biochemical aspects whereby plasma impacts cells and macromolecules has not been clarified completely. We have previously investigated the safety and efficacy of using plasma on ocular surface disorders in animal models [12,13]. We also achieved to perform successful interventions for treating conjunctival cyst [14], pinguecula [15], conjunctivochalasis (CCh) [16] and DED treatment with temporary punctal occlusion [17] by a Plasma Assisted Noninvasive Surgery (PANIS) as an effective method in managing OSDs that was introduced by our group for the first time.

We have previously reported that education may serve as a fast-yielding and significantly effective means of raising public awareness about glaucoma as a common disease impacting the posterior ocular segment which can cause blindness if left untreated [18]. So, the taught knowledge in combination with new outcomes in the arena can be improved and also new attitudes may emerge through medical seminars. Therefore, in this study, we tried to evaluate the impact of the education about PANIS method on ophthalmologists who attended our cobinar (conference + webinar) either in-person or online.

## Methods

This quasi-experimental study was designed as a pre-/post-test evaluation. It was conducted on 238 ophthalmologists who participated voluntarily in a cobinar (conference + webinar) entitled "Hot summer day with hot plasma topics" focusing on plasma intervention in ocular surface disorders (OSDs) and introducing PANIS method. Education was performed by 2 experts in dermatology who discussed the use of plexr

for the skin diseases and also 6 experts in ophthalmology (including the corresponding author of the current study) introducing PANIS method. Blepharoplasty with plexr is a common technique for removing excess skin without surgery globally. On the other hand, we have introduced PANIS (a Persian girl name) method for managing OSDs as an efficient, cost effective and simple method as mentioned above. A sample of 53 individuals was included in the study completed the questionnaire. Prior to the cobinar, the demographic data of the participants including gender, age, and specialty were obtained, and also the participants were asked to complete a pre-test questionnaire provided by the authors including 14 questions. Participant's knowledge about the plasma in the management of OSDs was evaluated by the first 8 questions (4 possible answers) with the following titles:

1. *Is plasma treatment (PANIS method) effective for recurrent subconjunctival hemorrhage?*
2. *In which type of conjunctival cyst, using plasma modality is not suggested?*
3. *Is plasma effective for temporary or permanent treatment of dry eye?*
4. *Which of the following is not true about treating pinguecula with plasma?*
5. *Which of the following is not true about blepharoplasty with plexr?*
6. *Which of the following is true about xanthelasma treatment with plexr?*
7. *According to the golden law of tissue ablation, when are best results achieved?*
8. *In which case, better results for blepharoplasty with plexr plus is expected?*

In order to evaluate the accuracy of the answers by the participants, question number 2 was not mentioned during the cobinar. The participant's attitude about the use of PANIS method was evaluated by the three following questions (Answers: Yes, No, No idea):

1. *Would you like to learn more about PANIS method?*
2. *Will you join our next event on plasma and PANIS?*
3. *Will you consider plasma as your first modality of treatment of OSDs or periorbital lesions?*

The enthusiasm among the participants for using PANIS method as their first line of treatment for OSDs or periorbital lesions was evaluated by the following question (with 19 possible options):

*For which OSDs or periorbital lesions, plasma is your first modality of treatment?*

Finally, two questions evaluated if the participants have attended such seminars previously, if yes, how

many times. After the initial data collection, participants attended a 4-hour cobinar session about the plasma and OSDs. After the session, the participants were required to complete the same questionnaire.

Questionnaire content validity was confirmed by experts qualitatively. 3 to 10 content experts, lay experts, and methodological experts reviewed the questionnaire and after evaluations, they confirmed the validity of the questionnaire. The raw data was organized by Microsoft Excel 2016 then the data was analyzed statistically by GrafPad Prism 8.0.2 software and represented as percentage, means, and SEMs and in order to and compare scores paired t-test was applied. The p-value < 0.05 was considered significantly different for every obtained data.

## Results

Total numbers of 53 ophthalmologists, 17 of whom had fellowship, enrolled in this designed quasi-experimental pre-/post-test study. Additionally, the participants were 31 to 66 years old including 21 women and 32 men. 18 individuals have never participated in our previous seminars and 21 individuals attended online in the session. The effect of the seminar on increasing the knowledge of the participants about the PANIS method was evaluated by 8 questions. In order to provide better insight question number 2 was not mentioned by speakers during the cobinar. Changing the attitude of the participants about the use of PANIS method was investigated through 3 questions and finally persuading the participants to use PANIS method was studied via 1 question with 19 possible choices.

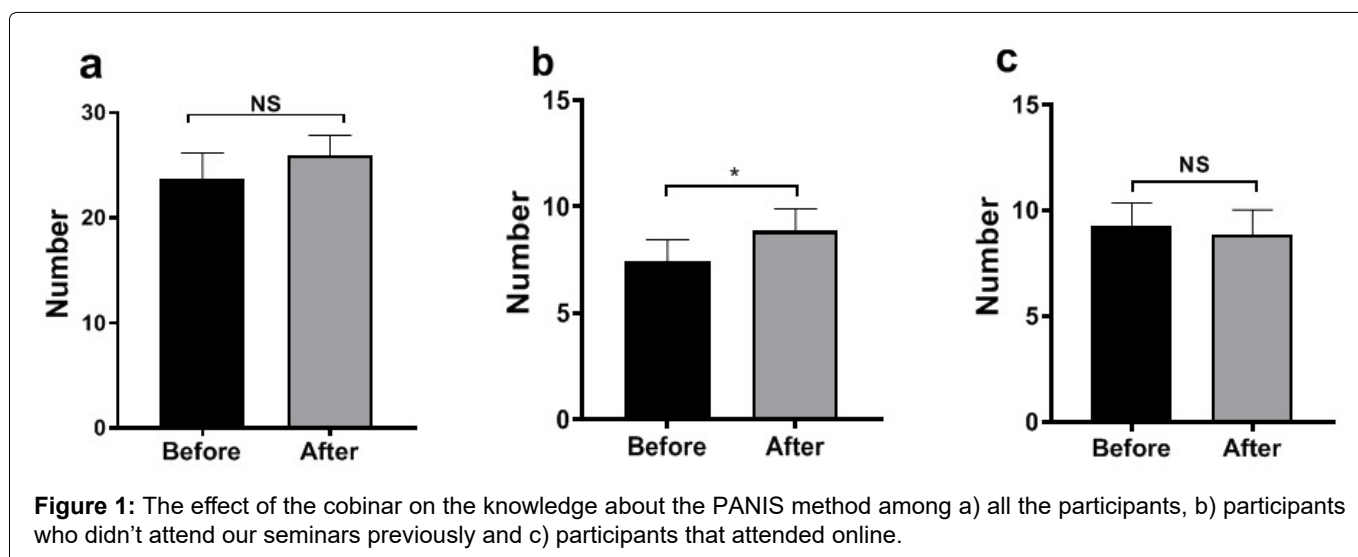
The results were extracted from 1<sup>st</sup> 8 questions (question 2 is excluded due to not mentioning in the cobinar) and presented in Figure 1. The data revealed that the cobinar didn't achieve to increase the knowledge about the topic among all the participants due to the pre-test score of 45% on average vs. the post-test score of 50% on average with p-value = 0.2277 (difference between means (post-pre)  $\pm$  SEM = 4.2  $\pm$  3%) (Figure 1a).

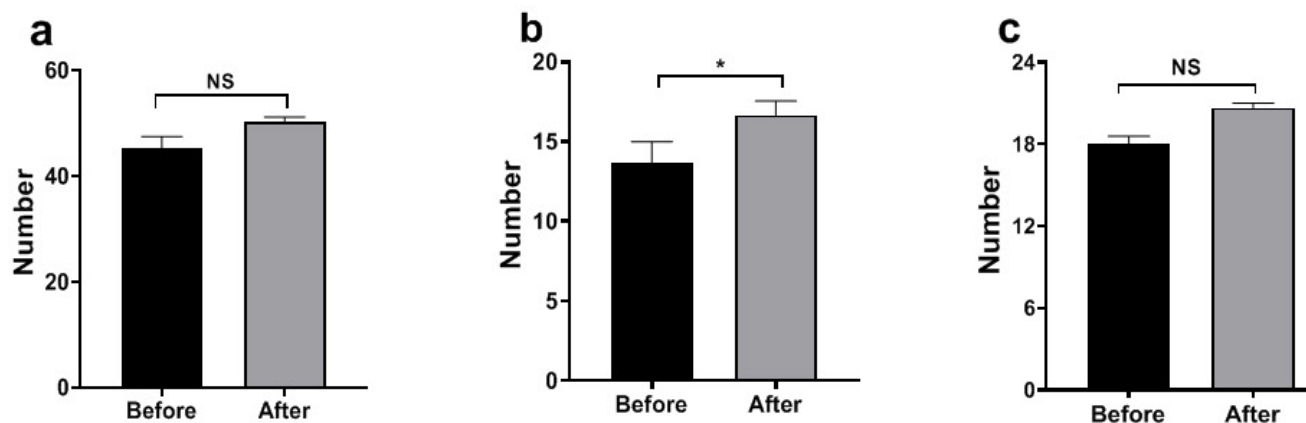
However, in the case of individuals who never attended our seminars previously, a significant increase in their knowledge about the topic was observed. As it is shown in Figure 1b, this group could score 39% on average in the pre-test while they scored 50% on average in the post-test (difference between means (post-pre)  $\pm$  SEM = 8  $\pm$  3% with p-value = 0.0465). In the case of the participants who attended online in the cobinar, the results revealed a non-significant decrease in their knowledge about the topics discussed in the cobinar (Figure 1c), so that 44% on average of the questions were answered correctly in the pre-test while only 42% on average of the questions were answered correctly in the post-test with p-value = 0.6036 (difference between means (post-pre)  $\pm$  SEM = -2  $\pm$  3.7%). It should be mentioned that the results indicated that before and after the cobinar, participants answered question number 2 variously and a significant difference was not observed for answering this question pre- and post-test (Table 1). So that it was confirmed that the knowledge of the participants was only affected by the topics which were discussed during the cobinar.

The obtained results from the next 3 questions evaluated the attitude of the participants about the use of PANIS method before and after the cobinar. These results are presented in Figure 2 revealing that the cobinar didn't achieve to change the attitude of the participants about the use of PANIS method among all of the participants. 85% of the participants on average wanted to learn more about the PANIS method and were prepared to consider this method as their first line of treatment of OSDs or periorbital lesions before the

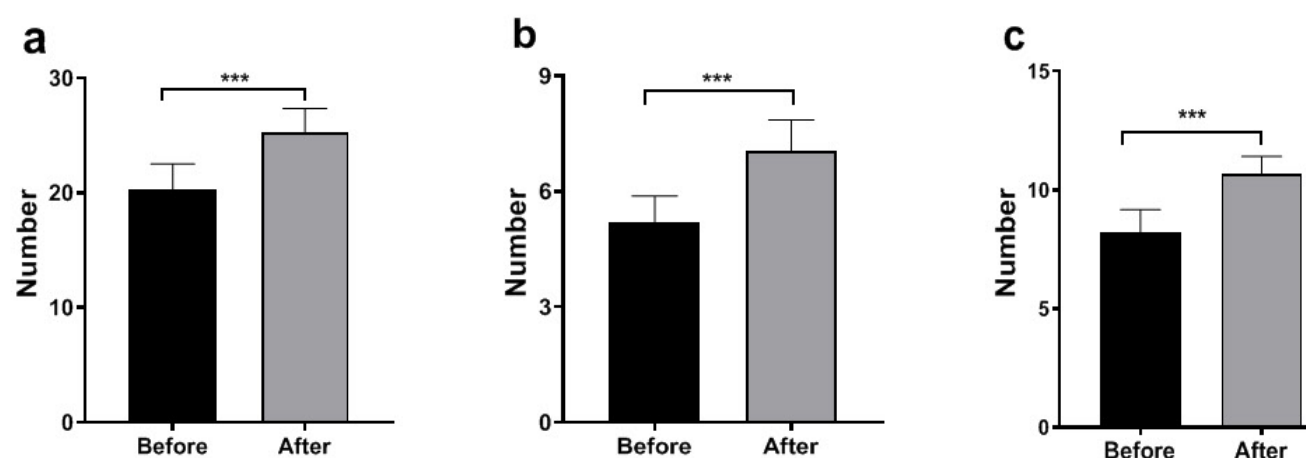
**Table 1:** Answering to question number 2 which was not mentioned in the cobinar.

| Question number 2                | Pre-test         | Post-test |
|----------------------------------|------------------|-----------|
| All participants                 | 53%              | 53%       |
| Participants not attended before | 16%              | 11%       |
| Participants attended online     | 24%              | 19%       |
| Significance of difference       | p-value = 0.1835 |           |





**Figure 2:** The effect of the webinar on the attitude about the use of PANIS method among a) all the participants, b) participants who didn't attend in our seminars previously and c) participants that attended online.



**Figure 3:** The effect of the webinar on enthusiasm for using PANIS method as the first line of treatment of 19 optional OSDs or periorbital lesions among a) all the participants, b) participants who didn't attend our seminars previously and c) participants that attended online.

cobinar (Figure 2a). Whereas 94% of them in average showed the same attitude after the cobinar (difference between means (post-pre)  $\pm$  SEM =  $9.4 \pm 2.8\%$ , p-value = 0.0820). However, in the case of individuals who never attended our seminars previously, a significant increase in their attitude was observed (Figure 2b). Prior to the cobinar, among this group, 78% (on average) of interest for learning more about the PANIS method was recorded while they scored 94% on average in the post-test for their attitude (difference between means (post-pre)  $\pm$  SEM =  $16.6 \pm 3.2\%$  with p-value = 0.0351). A non-significant increase in the attitude among the participants who attended online in the cobinar was observed (Figure 2c). So that 86% in average of the participants were interested in learning more and using of PANIS method in the pre-test and 95% on average of them repeated the same attitude in the post-test with p-value = 0.0942 (difference between means (post-pre)  $\pm$  SEM =  $12.8 \pm 4.3\%$ ).

The results indicating the effect of the cobinar on enthusiasm for using PANIS method as the first line of treatment of 19 optional OSDs are illustrated in Figure 3.

The obtained data demonstrated that the cobinar achieved to persuade the participants to use plasma as their first line of treatment for OSDs or periorbital lesions effectively. The efficiency of the cobinar on enthusiasm for using PANIS method as the first line of treatment of 19 optional OSDs or periorbital lesions was significantly approved among all participants regardless of previous attending experience or the type of attendance. The participants wanted to use the PANIS method in their career in only 38% (on average) of OSDs (19 options) before the cobinar (Figure 3a). While they were persuaded to use the plasma in the treatment of nearly half of the OSDs or periorbital lesions (47%) after the cobinar, with p-value  $<0.0001$  (difference between means (post-pre)  $\pm$  SEM =  $9.4 \pm 1.7\%$ ). The participants who never attended our seminars previously, scored 28% in average of enthusiasm for using PANIS method as their first line of treatment for OSDs or periorbital lesions before the cobinar while they scored 39% on average for the post-test (Figure 3b) with p-value = 0.0004 (difference between means (post-pre)  $\pm$  SEM =  $10.2 \pm 2.4\%$ ). In the case of participants who attended online, pre-test and post-test scores for using the PANIS method as their



first line of treatment for OSDs or periorbital lesions was recorded 38 and 52 % on average, respectively (Figure 3c) with  $p$ -value = 0.0001 (difference between means (post-pre)  $\pm$  SEM =  $11.9 \pm 2.4\%$ ).

## Discussion

This study was a further evaluation of education's impact on the knowledge and attitude of the participants in a cobinar session. The knowledge transfer and attitude changing through seminars enhance medical insights and introduce new outcomes in the field and also new methods of diagnosis and treatments make the ophthalmologists take advantage of these emerging strategies. We have evaluated the effectiveness of education in improving public knowledge and awareness about glaucoma previously [18]. The additional ophthalmology seminar series was suggested to influence the level of ophthalmic knowledge among medical students positively, and also a strong desire for more ophthalmology teaching was identified [19]. On the other hand, in order to provide successful learning outcomes from the seminars, the pre-test/post-test model is considered an effective method for evaluation [20]. Therefore, we designed this quasi-experimental study with a pre-/post-test evaluation to investigate the effectiveness of the cobinar on the plasma and OSDs on the knowledge and attitude of the participant ophthalmologists. It is worth to mention that we have performed 11 resemble seminars previously and 66% of the participants have attended in these seminars.

As it was mentioned above, we have introduced PANIS for the first time and this method can be considered as the first line of treatment of OSDs due to being simple, non-invasive, and affordable. The results indicated that the cobinar had a positive effect (5% of the increase) on the participants' knowledge about the topics (Figure 1a) however this increase was not statistically significant. On the other side, participants who never attended our previous seminars indicated a significant increase (11%) of their knowledge about the topics (Figure 1b). Thus, it is concluded that differences in the basic knowledge on plasma and OSDs among the participants lead to different outcomes, which is consistent with previous studies [21]. Impact on the knowledge of the participants who attended online was more complicated to interpret (Figure 1c) as we observed a decrease (2%) among this group and despite the non-significant difference between pre-test and post-test results, many factors might be involved. According to the pandemic, we have provided an occasion for 40% of the participants to attend online. Online education provides a safe and cost-effective opportunity for learning and the application of advanced educational technology has been progressing for teaching in ophthalmology [22]. Students described ophthalmology e-learning modules as a fun and engaging method that led to higher marks [23] which were contrary to the current

study. This might arise from the limitations of the study that will be discussed in the following. The accuracy of the answers was confirmed via question number 2 which was not mentioned by the speakers during the cobinar. According to the results, the knowledge of the participants remained intact in pre- and post-test, and significant change was not observed regardless of the type or previous experience of attendance.

Evaluating the attitude of the participants on the use of PANIS method before and after the cobinar revealed that while an increase among all groups (9% for all participants, 16% for participants not attending previously and 9% for participants attended online) was observed (Figure 2), only in the case of participants who not attended previously the increase was significant. It is worth noticing that a high score of  $95 \pm 4\%$  to learn more about the PANIS method among the participants indicates the attractiveness of the PANIS method among the ophthalmologists and emphasizes their interest to learn more about new effective methods for managing ocular disorders. It should be mentioned that observing the non-significant increase in Figure 2a, c results from high scores of pre-tests (85% on average) indicating of much interest in the topic among the participants at the beginning of the session because they have experienced our previous seminars.

The results illustrated in Figure 3 demonstrated that the cobinar achieved to enhance the enthusiasm of the participants for using PANIS method as their first line of treatment for OSDs or periorbital lesions efficiently, regardless of their attendance previously or the way they attended in the session. In this section, we gave the participants 19 options that could be managed by plasma. In the post-test, participants selected options were significantly more when compared to the pre-test scores. Regarding this 9.4, 10.2, and 11.9% increase in average was observed for all participants, participants not attending previously, and participants attended online, respectively. Conjunctival cyst, xanthlasma, plexr blepharoplasty, conjunctivochalasis, pyogenic granuloma, pinguecula, and symblepharon were selected by the participants more frequently (data not shown), and favre-racouchot syndrome and tuberos sclerosi were among options that gained less interest by the ophthalmologists (probably because they belong to the field of dermatology). This result indicated that the cobinar had a great impact on the enthusiasm of the participants for using PANIS method as their first line of treatment for OSDs or periorbital lesions. It was also revealed that such seminars have the potential to act as an attractive learning method to introduce new treatment strategies which are accepted by the participants mostly. Therefore, it is strongly suggested that presenting new therapies should be the main concern of the lecturers and/or speakers during medical seminars.

The results suggest that it is crucial for both participants and those who perform the seminars to consider the pre-/post-tests evaluations prior to the session which guarantees more accurate data for further investigations. Inviting expert speakers is another important concern for performing the seminars to assure the knowledge transfer and changing attitude are made appropriately.

Limitations in our study included a small sample size, and in the case of participants who attended online, IT skills and network fluctuations. Most of the participants have attended previously and this made the results challenging to interpret. Post-test evaluations were obtained shortly after the webinar, and the long-term effect was not investigated.

## Conclusion

Education encountered the greatest challenge ever during the COVID-19 pandemic. E-learning was found to consider as the best solution for this issue. On the basis of the results from this study, the ophthalmology webinars have the potential to enhance the knowledge of the participants as well as change their attitude about a certain subject. Our results revealed that online education can serve as an effective method to transfer the knowledge and impact attitude of ophthalmologists to use new methods in the arena. We achieved to increase the knowledge of attended ophthalmologists about PANIS method via a webinar. The best results were obtained from participants who never attended before. We also achieved to change the attitude and increase the enthusiasm of the ophthalmologists to use PANIS method as the first-line treatment of OSDs or periorbital lesions.

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