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ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

**Webinars in general practice placement
for final year medical students
A mixed-method analysis**

OBJECTIVE To present the insights and opinions of medical students on the use of web-based seminars (webinars). **METHOD** During their four-week placement in general practice (GP), 118 final-year Greek medical students were asked to voluntarily attend webinars on the topics of “multimorbidity” and “motivational interviewing”. They were subsequently invited to participate in an anonymous online survey on their experience of the webinars. The questionnaire included closed-ended questions on a 5-point Likert scale regarding the usefulness of these webinars, and open-ended questions regarding their advantages and disadvantages. **RESULTS** The participation rate was 93% (110 of 118 students) and the response rate 89% (98 of 110 participants). The overall response to the webinars and estimation of their effectiveness were positive, with a mean score of 3.60 ± 1.02 and 3.59 ± 1.13 , respectively, on the 5-point Likert scale. Specifically, 58/98 medical students (59%) stated that they would participate in webinars organized at least once weekly. Concerning the answers to the open-ended questions, students highlighted the accessibility of webinars, which helped them to keep in contact with the university environment. The major disadvantages reported were the lack of face-to-face communication, and technical issues. **CONCLUSIONS** The use of webinars is a novel teaching approach in the GP setting. It can successfully confront the barrier of distance which derives from the need for the simultaneous teaching of medical students in scattered geographical areas. This study exhibits the positive attitude of medical students towards the use of webinars in this field, in conjunction with the traditional models of teaching.

Online learning systems, colloquially known as e-learning, have become increasingly popular in the education of healthcare professionals, largely due to the increased availability and coverage of the internet,¹⁻⁶ but also following the growing need for remote learning that emerged due to the Covid-19 pandemic.⁷⁻⁹ In contrast to similar web conferencing systems, web-based seminars (webinars) are specifically designed to serve educational purposes.⁵ They provide a platform where facilitators and participants can communicate across distant geographical locations with a range of electronic devices,¹⁰⁻¹² allowing for real-time interaction between the lecturer and students via voice-over internet protocol (IP) technology, using web camera equipment.^{4,11-16}

The use of webinars has been well documented as being complementary to in-person learning, in a variety of different settings and fields of medicine, including: as part of the university course curriculum for medical students,⁴ as a medium to enhance engagement in clinical academia,^{15,17} in school wellness strategies,¹⁸ in specialty trainee education, as a useful tool of continuing training,^{13,14,17} and finally, in primary care coaching and prevention strategies.^{14,19-21} The rapid expansion of Covid-19 has forced medical educators to consolidate distance learning environments and, in a few weeks, convert the majority of face-to-face didactic sessions to webinar sessions, in an effort to respond to the new circumstances.^{8,9} This health crisis poses a unique

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Τηλεκπαίδευση κατά την κλινική
άσκηση στη Γενική Ιατρική
των τελειόφοιτων φοιτητών
Ιατρικής: Μια ανάλυση με τη χρήση
μικτής μεθοδολογίας

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challenge in medical education, which has inevitably led to the escalating popularity of webinars. Despite this rapid development, our literature review revealed no documentation on the use of webinars as a teaching tool in general practice (GP) placements.

Several studies have presented interesting data regarding the efficacy of webinars in higher education. Three of the largest systematic reviews and meta-analyses demonstrated that webinars, and other live teaching systems, are slightly more effective than other more traditional methods using pre-recorded content,^{5,12,22} although the differences were minor and not statistically significant. The utility, acceptance, and accessibility of webinars are well described in the literature,^{2,5,12,14,17,19,23–25} but the role of webinars in medical education remains a controversial subject.⁴

Although the perceptions of participants can be used to evaluate the educational process and outcomes,^{10,26} they have not been widely studied and need further investigation.²⁵ The current data are limited, but infer that students and teachers generally have a positive attitude towards webinars. They report satisfaction from their experience in the online educational environment, stating that they would participate in further e-seminars and recommend webinars to their colleagues. They felt that they had gained useful knowledge which they were comfortable implementing.^{1,4,13,14,16,18,27–29}

The academic curriculum of the Aristotle University of Thessaloniki (AUTH) School of Medicine includes a GP placement in the final year of medical studies. It takes place in various Primary Health Care (PHC) Centres across the country, with a variety of health professionals sharing the responsibility for the theoretical and clinical teaching of the medical students. Each educator uses a particular teaching approach; this is to be expected and is acceptable, providing the educational learning objectives are met. In an effort to ensure that the minimum teaching standard is achieved across the different clinical and teaching environments, webinars were implemented as an additional educational tool. This was compatible with the distant geographical locations required by the placement and it allowed exploration of webinars as a teaching tool in the GP setting. This study aimed to explore the views of final year medical students regarding the webinars, which were organised by the host-academic department.

MATERIAL AND METHOD

The first group of 6th-year medical students of the AUTH School of Medicine, comprising 118 students, attended their GP rotation in November 2019 in PHC Centres around the country. During

this period, the students were asked to participate in optional webinars on the topics of “The Management of Multimorbidity in Primary Health Care” and “The Motivational Interview for Behavioral Change”. The webinars were conducted by the same facilitator via the communications platform “Skype for Business”. They took place during the second and third weeks of GP placement, on different evenings, each lasting for one hour and 30 minutes.

At the end of these webinars, the medical students were asked to complete an anonymous online questionnaire. They were previously informed of the aims of the survey, and therefore, by completing it, they automatically agreed to participate, giving their informed consent. The medical students were asked to evaluate the usefulness of the webinars and the appeal of the chosen topics, which they rated using a 5-point Likert scale. They were also asked about the ideal frequency of such seminars. In addition, the medical students had the opportunity to use the free text feature to write their comments on the positive and negative aspects of the webinars, and to provide suggestions for the future development of the online programme.

The data collected in this way were analyzed quantitatively and qualitatively. Regarding the quantitative analysis, the mean scores and standard deviation (SD) of the responses on the Likert scale were calculated. For the open-ended questions, a qualitative analysis approach was used; the data were analyzed using a two-stage thematic analysis procedure, the first stage of which was conducted by two members of the group and the second by all members involved. The first step of the qualitative process was to analyze the participants’ quotes into a conceptual formulation, in order to generate initial codes and to define and name themes. The next step involved assessment and interpretation of the initial analysis and creation of the final themes for the final report.

RESULTS

The data collected provided largely positive and encouraging results. In terms of engagement, of the 118 students who attended the first rotation of the GP placement in PHC Centres around the country, 110 participated in the optional webinars (93% participation rate) and 98 filled in the online survey (89% response rate).

Quantitative findings

The interest and usefulness of the webinars were rated, using the 5-point Likert scale ranging from 1=not at all to 5=extremely, with an average score of 3.60 ± 1.02 and 3.59 ± 1.13 , respectively.

More than half of the participating medical students, 58/98 (59%), stated that they would like to participate in webinars at least once a week; 13/98 students (13.26%) stated that they think seminars are not required at all (figures 1, 2).

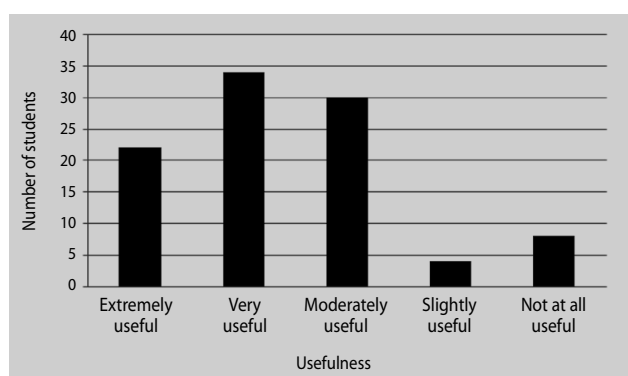


Figure 1. The usefulness of webinars during their general practice (GP) placement, according to final year medical students.

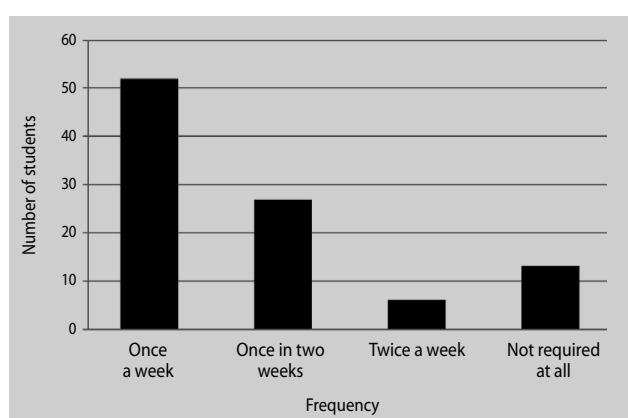


Figure 2. The ideal frequency of webinars during their GP (general practice) placement, according to final year medical students.

Qualitative findings

In the free text question on the “positive aspects of webinars”, 74 responses (75.51%) were recorded, in the question on the “negative aspects of webinars”, 51 responses (52.04%) were recorded, and in the question regarding “suggestions for future improvements”, 34 responses were recorded (34.69%). The qualitative analysis resulted in grouping of the quotes into the following three themes: teaching method, communication with the academic department, and technical means. Key themes from the students’ answers are summarized in table 1.

Teaching method

The teaching method was described as original, pleasant, modern, and experiential and it allowed the simultaneous observation of large numbers of individuals. One of the advantages of webinars noted was that students felt that they were able to manage their personal time more effectively.

The disadvantages of this teaching method reported were the lack of visual contact and reduced interactivity between the teacher and the audience. As one medical student mentioned:

“There is no feedback for the teacher if he moves on the topic faster or slower because he does not see his audience.” (Student – S60).

Table 1. Themes and codes from qualitative analysis of positive/negative aspects of webinars during general practice (GP) placement and suggestions for future improvement.

	Positive aspects	Negative aspects	Suggestions for future improvement
<i>Teaching method</i>	Original Pleasant Modern Experiential Synchronous observation of large numbers of individuals Better personal time management	Lack of visual contact Reduced interactivity between the teacher and the audience	Live polls during the webinar Smaller groups of participants Short duration Variety of issues
<i>Communication with the academic department</i>	Direct contact between teachers and students Ability to exchange ideas, and share experiences	Absence of interpersonal communication, leading to difficulty of participants to speak freely Being inactive due to lack of familiarity with the process, and the presence of so many people	Smaller groups that allow in-depth discussions
<i>Teaching means</i>	Ability to comfortably attend sessions, despite distant geographical locations	Lack of availability of internet in some areas Slow internet connections Lack of appropriate technology	Presentations to be uploaded as videos or podcasts

The students made several proposals regarding improvement of this teaching method. It was commonly stated that reducing the duration of each webinar would promote better concentration and provide a more pleasant experience overall. Greater value would be added by having the opportunity to discuss a greater variety of issues, and implementing different methods to increase the interaction between the students and their professor. In particular, it was suggested that:

"Live polls can be used during the webinar" (S25).

"The webinars should be delivered in smaller groups, separated according to the geographical location of the PHC Centers" (S59).

Communication with the academic department

There was substantial positive feedback regarding communication with the academic department. The main benefits cited by the students were the ability to stay connected with their teachers and the academic environment in general while on an off-campus rotation. In addition, they were able to ask questions and receive needed guidance from their professor in real time, which was welcomed by many students.

"We had constant interaction with the academic department and its learning opportunities" (S42).

Concerning negative aspects, the students highlighted the lack of interpersonal communication, leading to some participants being unable to speak freely or feeling embarrassed during online communication.

"Being inactive due to lack of familiarity with such processes and the presence of so many people" (S74).

Hence, one of the solutions suggested was to divide the students into smaller groups. This would allow more intimate and in-depth discussions, where the students would feel more comfortable to speak freely.

Technical means

Regarding the technical means, the primary advantage of webinars is the ability to attend sessions comfortably, despite the distant geographical locations of the placements.

In terms of connectivity, the lack of internet in some areas or slow internet connections caused problems with audio and video quality, and screen sharing. Specifically:

"There is a need to improve the connectivity, since in some cases the audio or image was lost" (S41).

"There were some technical problems, especially with screen sharing" (S75).

These were significant factors that affected participation in the webinars. Finally, regarding the availability of electronic equipment, some students identified the lack of appropriate technology as a preventive factor for attending the online seminars.

In order to counteract these weaknesses, it was suggested that:

"The presentations should be uploaded as videos or podcasts, in addition to the existing file of the PowerPoint presentation, for them to be available as a follow-up when a better internet connection is available" (S42).

DISCUSSION

Our survey endeavoured to evaluate the attitudes of medical students to webinars as a medium for learning within their GP placement in undergraduate medical education. Overall, the results of our study demonstrated that webinars in GP placement are a viable and acceptable teaching method for the majority of medical students. Based on the analysis of both qualitative and quantitative data, this positive reception can be attributed to the multiple advantages of live webinars. Among these are participation in the process from the convenience of each student's personal space, the direct interaction and active involvement between teachers and students, and the opportunity for constant connection with the academic community despite the considerable barrier of distance.^{4,6,12,16,25}

The most important element in the widespread dissemination of this innovative teaching method is undoubtedly the ability of webinars to provide an environment for students to gain access to knowledge from anywhere they may be.^{21,28,30} There is no need for students to leave their personal space to go to a classroom, since any physical space can function as a classroom.^{4,5,11} The method is time- and cost-efficient, because online attendance does not require the use of transport.^{6,16,31} The benefits are multiplied in the case of GP placements where there is often a great distance between the PHC setting and the host-university. Inevitably, the use of webinars as a medium for enhancing engagement in clinical academia is expected to be increasingly common amongst students located in remote areas.^{15,17} Hence, these seminars provide the means to fill the potential gap in teaching, ensuring minimum teaching time where it cannot be achieved otherwise.^{6,11,12}

Another element highlighted in various other studies

and confirmed by our findings, is that a significant proportion of participants indicated that they are more likely to actively participate in discussion or respond to questions asked by lecturers in a webinar than in a conventional classroom.^{4,5} Thus, webinars may be an ideal environment for shy individuals to express their opinions and queries more comfortably and thus to benefit more from the educational process.²⁸ However, for other students, the online environment creates feelings of loneliness and isolation, which should not be overlooked.⁷

Currently, a distance seminar can facilitate up to 3,000 participants, with this number likely to increase as time goes on.¹⁶ However, although the participation of large groups in webinars may offer the benefit of providing education to more people, many students, like those in our study, have suggested that small groups would be more beneficial for their learning purposes.²⁷ As our students proposed, small groups encourage a discussion where everyone participates, and the number of those simply observing is minimized, which improves interpersonal communication and reduces any feelings of embarrassment or awkwardness. Lack of effective communication and interaction among the participants is considered to be one of the most important barriers when delivering remote learning; overcoming this barrier, for example by using small groups, would lead to increased efficacy of webinars.³²

A variable feature of long-distance seminars is their duration, which can vary from 30 minutes³ to several hours.³³ The research data to date does not provide a clear idea on the ideal duration of seminars, and currently the individual teacher will determine the appropriate time frame on a case-by-case basis, based on experience.⁵ Longer webinars do not necessarily correlate with a greater learning potential, as verified in our study where some students described the 90-minute duration of the seminars they attended as too demanding.

Another feature of webinars is their frequency, with some being self-contained³⁴ and others repeated at regular or non-regular intervals.³⁵ The duration and frequency of the seminars appear to be inextricably linked with their efficiency.⁵ It should be noted that our students would value having the opportunity to discuss a greater variety of issues, participating in shorter and more frequent webinars. Understanding the needs, perspectives and priorities of the students is of significant value when organizing the appropriate internet-based courses; in this framework, educators could address a set of questions to the students before the webinars, in order to maximize their effectiveness and acceptance.²

Theoretically, conducting and participating in a webinar is simple and requires each participant to have an internet-enabled device, i.e., a computer or mobile smartphone.^{4,11,28} Given the proliferation and constant evolution of the technical means and infrastructures available to students in recent years, this factor is impeding their access to webinars less and less.⁵ However, in our study several students stated that they had encountered technical difficulties, most of which were due to their inability to access the internet, especially in remote areas with slow or moderate internet connection. Therefore, it can be assumed that ability with, and access to online technology remains a barrier to online learning for some students.^{1,22,32}

It is important for the webinar organizers to choose with care the platform to be used. Specific online environments have been shown to be associated with greater success and increased gain in the cognitive skills of the participants.¹² Several popular webinar platforms are available, and the options seem to be numerous; each presents advantages and disadvantages, and the ideal webinar platform depends on the specific educational needs.³⁶ Our online video calling platform has proved to be a good medium for conducting webinars. However, the way the trainer uses the available technology may ultimately be more important than the technical means.^{22,28,37,38}

Since the emergence of Covid-19, medical education has inevitably been disrupted by the implementation of social distancing, and the clinical exposure of many medical students across the globe has been reduced or even eliminated, and clinical attachments and electives have been discontinued for safety reasons.^{39,40} Under these circumstances, medical schools have been forced to fulfil the escalating educational needs at short notice by delivering remote learning. Web-based learning strategies have rapidly been navigated for implementation in order to complete curricula; these methods have proved to be incredibly popular, to the extent that they may be applied routinely in subsequent years. It appears, therefore, that although online education technology and web-based learning environments had already been studied and developed for more than a decade, the recent Covid19-induced health crisis triggered the wider expansion of distance learning strategies, and undoubtedly more thorough investigation of the usage of such online platforms in medical education is now called for.⁷⁻⁹ To our belief, the long-term educational benefits of distance learning have yet to be proven; thus, when the physical presence of the students in classes is feasible, webinars should be used only in conjunction with traditional models of teaching.

Strengths and limitations of the study

Webinars are a relatively new medium for delivering higher education, especially in the field of medicine. Our study described participant feedback on the acceptability and identified the elements of highest importance for evaluating and improving this novel educational intervention. As noted above, our research revealed no documentation of the use of webinars as a teaching tool in GP student placements. We attempted, therefore, to describe the implementation and the assessment from the students' perspective of an innovative teaching method in an unfamiliar setting (PHC), and we hope that this study will form the cornerstone leading to further investigation of this subject.

It is noteworthy that our study achieved a remarkably high response rate of 89%, particularly in comparison to the response rates of other studies which document rates ranging from 30% to 52%.^{16,18,25,41–43} Moreover, the study had a sufficient number of participants compared with similar studies,^{4,5,16,17,29,43–45} and the sample size is considered to be more than adequate for drawing safe conclusions.

Nevertheless, there were some methodological limitations. Firstly, inherent to the nature of the study, the use of self-reported measures introduces a response bias, part of which was mitigated by the anonymity of the questionnaire. Regarding the webinar technology, some students experienced audio-visual difficulties and other technical problems, which may have affected their overall evaluation as reflected in their free-text comments, but this variable was out of our control. Organizational problems may also have affected the attitudes of some students. The success of a series of webinars depends strongly on the design and experience of the organizers.^{22,27,31}

Despite a large number of participants, we are aware that the number of webinars held was small, with only two sessions provided, which limits the validity and generalization of our study, and the results should be interpreted with caution. Additionally, according to the Kirkpatrick model for outcome evaluation in medical education,^{46,47} our learning evaluation can be classified as presentation of level one data, only, since we assessed the reaction of the students to the novel teaching approach, but did not

evaluate either the knowledge gained from webinars or behavioral changes and long-term results. In the future, it would be interesting to investigate the effectiveness of the webinars, using a pre-webinar test and post-webinar testing, and also comparing the results with the perceptions of the students.

In conclusion, it is apparent that webinars and eLearning have a multifaceted impact on medical education. Monitoring medical students over time, after attending several long-distance seminars during their GP placement in PHC settings, could form the basis of future studies that would lead to particularly useful conclusions. The setting of clear standards for the organization and application of such seminars is crucial for their success, and it is essential, also, to seek strategies for the promotion of this innovative method of teaching, to attract the students. The use of webinars is a novel, innovative teaching concept, especially in undergraduate medical education in GP placements. This study demonstrates the positive attitude of the medical students towards the utility of webinars, complementary to traditional models of teaching.

GLOSSARY TERMS

Webinars: Web-based seminars using a platform where facilitators and participants can communicate via voice over IP technology and web camera equipment, in real time, across distant geographical locations with a range of electronic devices.

ETHICS STATEMENT

This study has been submitted for an ethics review in order to obtain formal approval or exemption from the institutional Ethics Committee. The AUTh Ethics Committee decided that special ethics approval is not necessary for such kind of research. This study was also performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki, and was conducted ethically and responsibly, in full compliance with all relevant codes of experimentation and legislation.

ΠΕΡΙΛΗΨΗ

Τηλεκπαίδευση κατά την κλινική άσκηση στη Γενική Ιατρική των τελειόφοιτων φοιτητών Ιατρικής: Μια ανάλυση με τη χρήση μικτής μεθοδολογίας

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ΣΚΟΠΟΣ Η παρουσίαση των απόψεων των φοιτητών Ιατρικής όσον αφορά στην τηλεκπαίδευση με τη χρήση webinars. **ΥΛΙΚΟ-ΜΕΘΟΔΟΣ** Κατά τη διάρκεια των 4 εβδομάδων της κλινικής άσκησης στην πρωτοβάθμια φροντίδα υγείας (ΠΦΥ) σε κέντρα υγείας της Ελλάδας, 118 τελειόφοιτοι φοιτητές Ιατρικής κλήθηκαν να παρακολουθήσουν εθελοντικά εξ αποστάσεως σεμινάρια. Τα webinars αφορούσαν στη «Διαχείριση της πολυνοσηρότητας στην ΠΦΥ» και στην «Κινητοποιού συνέντευξη για την αλλαγή συμπεριφοράς». Στο τέλος των σεμιναρίων, ζητήθηκε από τους φοιτητές να συμπληρώσουν ένα ανώνυμο ερωτηματολόγιο που περιλάμβανε ποσοτικές ερωτήσεις για τη χρησιμότητα των webinars, βαθμονομημένες σε κλίμακα 1–5 (1=καθόλου, 5=πάρα πολύ) και ποιοτικές ερωτήσεις σχετικά με τα θετικά και τα αρνητικά τους στοιχεία. **ΑΠΟΤΕΛΕΣΜΑΤΑ** Εκατόν δέκα από τους 118 φοιτητές παρακολούθησαν εθελοντικά τα webinars (συμμετοχή 93%) και 98 από αυτούς συμπλήρωσαν το ερωτηματολόγιο (απαντητικότητα 89%). Το ενδιαφέρον και η χρησιμότητα των webinars αξιολογήθηκε ιδιαίτερα θετικά (μέσος όρος απαντήσεων 3,8/5±1,02 και 4,03/5±1,13, αντίστοιχα), ενώ 58 φοιτητές (59%) δήλωσαν ότι θα επιθυμούσαν τη συμμετοχή σε webinars τουλάχιστον μία φορά την εβδομάδα. Οι ποιοτικές απαντήσεις αναδεικνύουν ως πλεονεκτήματα των webinars τον άμεσο και διαδραστικό τους χαρακτήρα, καθώς και την ευέλικτη και άνετη πρόσβαση που επιτρέπει τη συνεχή επαφή με το ακαδημαϊκό περιβάλλον. Στα μειονεκτήματα, οι φοιτητές πρόβαλαν την έλλειψη διαπροσωπικής επικοινωνίας και εξοικείωσης με τη διαδικασία, τη μεγάλη διάρκεια και ορισμένα τεχνικά ζητήματα. **ΣΥΜΠΕΡΑΣΜΑΤΑ** Η χρήση των webinars αποτελεί σύγχρονο καινοτόμο εκπαιδευτικό μέσο στην προπτυχιακή εκπαίδευση αντιμετωπίζοντας με τον καλύτερο τρόπο το εμπόδιο της απόστασης που προκύπτει από την ταυτόχρονη εκπαίδευση φοιτητών σε διαφορετικά κέντρα υγείας της Ελλάδας. Η θετική αξιολόγηση της χρήσης webinars αναδεικνύει την ανάγκη ενίσχυσης ανάλογων εκπαιδευτικών προσπαθειών, συμπληρωματικά της διά ζώσης εκπαίδευσης.

Λέξεις ευρητηρίου: Γενική Οικογενειακή Ιατρική, Εξ αποστάσεως διδασκαλία, Προπτυχιακή ιατρική εκπαίδευση, Πρωτοβάθμια φροντίδα υγείας

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