



## Original Article

# SNI/SNI Digital-Baghdad neurosurgery educational series

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## ABSTRACT

**Background:** Access to high-quality neurosurgery online learning is limited in low- and middle-income countries, and Iraq is part of this category. The need for collaboration and connection of people worldwide to exchange ideas and experiences in neurosurgery is a challenge. Surgical Neurology International® (SNI)/SNI Digital stimulated the establishment of the joint effort to bring the discussion about the best experiences in neurosurgery from the United States and Iraq together in an internet meeting format.

**Methods:** An online survey was formulated and distributed to the attendees of the SNI-Baghdad neurosurgery meetings. The survey investigates the last 14 consecutive meetings for the period May/2021–April/2022. The online survey was designed utilizing Google Forms. The survey outline includes demographics, general aspects of the meetings, research aspects, surgical anatomy, neuroradiology, and capacity-building aspects. All these sections of the survey used a 5-point Likert scale.

**Results:** The total number of participants was 84 out of 115 sent, with a response rate of 73.1%. The participants were diverse as they ranged from medical students to attending neurosurgeons. The male-to-female ratio was 1:1. Most attendees were from Baghdad ( $n = 66$  [77.6%]) and the highest number of the responders was from the University of Baghdad ( $n = 46$  [54.1%]).

**Conclusion:** The targeted online collaborative meetings, SNI-Baghdad neurosurgery meeting as an example, give an insight into the effectiveness of such methods in providing a mutually beneficial educational experience between people of different parts of the world, as assessed by a survey initiated and performed by the attendees.

**Keywords:** Interactive teaching, Iraq, Survey, Neurosurgery, Neurosurgery education

## INTRODUCTION

Reestablishing educational programs in a country after years of external war, division, and internal conflicts are a challenge. Uniting people under such circumstances is not easy to establish but can be accomplished, as shown in this paper. Neurosurgery is an important specialty because of the high percentage of head injuries during what time. In the previous work of Dr. Hoz (vascular

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neurosurgeon, neurosurgery teaching hospital, Baghdad, Iraq, now postdoctoral fellow, Department of Neurosurgery, University of Cincinnati, Cincinnati, Ohio, USA) and his team includes a paper in which Dr. Hoz described how he was able to inspire students to become interested in the central nervous system by developing weekly talks, laboratory sessions for direct surgical experience, and interactive relationships necessary to stimulate long-term interest in neurosurgery and other areas of medicine.<sup>[3]</sup> In another paper, the authors describe extending this educational experience with the attendees and an international faculty using interactive presentations to introduce all participants to the ideas of others. The survey reported in this paper shows how the attendees of these monthly conferences reacted to the different types of interactions and discussions and how they were affected by the meeting.<sup>[4]</sup> In the same paper, the authors extend these educational experiments to the first modern neurosurgery national meeting in some years in Iraq and which was “The best meeting I had ever attended” by many attendees. The attendees heard talks by neurosurgeons from Iraq and one from the USA with some international discussants. All the presentations were innovative and inspiring and allowed attendees to “dream” and “feel proud” of their country about what some had accomplished.<sup>[4]</sup> With the cooperation of Surgical Neurology International® (SNI)/SNI Digital, more similar educational experiences are planned as alternatives to one-way Zoom teaching. The involvement of the audience in these presentations is crucial in making this educational experience satisfying. Bright, talented people exist everywhere in the world. This quality is not related to money but more to individual inspiration and commitment.

Education using online educational methods is one of the mainstream learning tools globally today.<sup>[5]</sup> However, access to high-quality neurosurgery online learning is somehow limited in low- and middle-income countries, and Iraq is part of this category.<sup>[1,2]</sup> The need for collaboration and connection of people worldwide to exchange ideas and experiences among neurosurgery is a challenge but of great benefit in broadening different views of any subject. SNI/SNI Digital stimulated the establishment of this joint effort to bring the discussion about the best experiences in neurosurgery from the United States and Iraq together in an internet meeting format. The virtual meetings utilized the Zoom platform. Meetings involved presentations of clinical experiences through lectures and commenting on clinical challenges. Presentation of research work, discussion of the basics of forming research questions, and designing methods of solving those questions were also included in the study, as were general discussions of neurosurgery, medicine, and life experiences worldwide. Selective meetings were held to address some issues Dr. Hoz and the SNI faculty raised in more detail on a variety of subjects initiated by the main meetings. Exchanges of experience in social, political, cultural, and management in people-related issues were also presented to better shape the

educational experience to the local needs. Attendees included medical students from Iraq, Azerbaijan, Romania, and the USA, with residents of neurosurgery as well. In Iraq, students attend medical school for 6 years and then select a specialty of interest to pursue in medical school. Then, they can apply for the national or Arabic board, where they become identified as residents and eventually attendings. Twelve meetings occurred monthly from May/2021 to April/2022, lasting up to 2 h a session. The later sessions were recorded for others to experience if they could not attend the regular meetings. In this paper, we will describe the online survey results from the perspectives of participants who attended the Surgical Neurology International-Baghdad (SNI-B) online meetings. We will give an insight into these methods of providing a mutually beneficial educational experience between people in different parts of the world, as assessed by a survey initiated and performed by the attendees. More than 50 attendees were present at each meeting.

## MATERIALS AND METHODS

The online survey was designed utilizing Google Forms which is a survey administration software. The survey was distributed to the participants who attended the SNI-B meeting during the defined 1-year time. The survey was conducted over a 6-day period. From April 6, 2022, to April 12, 2022, 115 survey requests were distributed to the meeting participants for the year, and 84 responded.

The survey structure includes demographics, general aspects of the SNI-B meetings, research aspects, surgical anatomy, neuroradiology, capacity-building aspects, and suggestions for improvement. All these aspects of the survey used a 5-point Likert scale to assess the answers to the questions proposed. Answers were rated from strongly disagree (0) to 4 which is strongly agree. The Statistical Package for the Social Sciences version 28 was used to conduct the statistical analysis. All other ethical approval and consideration were made by the members of the participant group, excluding the faculty.

## RESULTS

The general characteristics of the sample are illustrated in Table 1, and the questionnaire with their percentages is displayed in Table 2.

The total number of responding participants was 84 out of 115 sent, with a response rate of 73.1%. Those responding were from the eastern part of Iraq, with about 40% of the land area of Iraq. The majority of the responders (77.6%) were from Baghdad province, which is the capital and largest city in Iraq, five from Dhi Qar, four from Maysan, and the rest from other provinces in Iraq. Participants from different medical education stages were part of this study, including medical students in the second stage ( $n = 8$  [9.4%]), the third stage ( $n = 42$  [49.4%]), and the fourth stage ( $n = 13$  [15.3%]), and others.

**Table 1:** Characteristics of the sample.

Category	Number	Percentages
Provinces		
Baghdad	66	77.6
Erbil	1	1.2
Babil	2	2.4
Al-Muthanna	1	1.2
Dhi Qar	5	5.9
Diyala	1	1.2
Karbala	1	1.2
Maysan	4	4.7
Ninawa	1	1.2
Wasit	2	2.4
Medical school		
University of Al-Mustansiriya/ College of Medicine	11	12.9
University of Aliraqi/College of medicine	7	8.2
University of Anbar/College of Medicine	1	1.2
University of Babylon/College of Medicine	3	3.5
University of Baghdad/ Al-Kindy College of Medicine	1	1.2
university of Baghdad/College of Medicine	2	2.4
University of Diyala/College of Medicine	46	54.1
University of Kufa/College of Medicine	1	1.2
University of Mosul/College of Medicine	1	1.2
University of Thi-Qar/College of Medicine	2	2.4
University of Wasit/College of Medicine others	7	8.2
Stage		
2 <sup>nd</sup>	8	9.4
3 <sup>rd</sup>	42	49.4
4 <sup>th</sup>	13	15.3
5 <sup>th</sup>	9	10.6
6 <sup>th</sup>	4	4.7
Graduated (junior doctor)	2	2.4
Resident	3	3.5
Attending	3	3.5

The participants in the SNI-B meeting were diverse as they ranged from medical students to attending neurosurgeons. The male-to-female ratio was 1:1. Most attendees were from Baghdad ( $n = 66$  [77.6%]), and the highest number of the responders was from the University of Baghdad/College of Medicine ( $n = 46$  [54.1%]).

The SNI-B meetings were held on Sunday, in the evening Iraqi time, once a month. This time was convenient for 80% of the attendees. About 90% found Professor Lazareff's

lectures on the principles of research helpful, and 80% rated the discussions after each presentation highly. About 50–65% believed their abilities to develop research ideas, review the literature, and write papers improved with these meetings. The average individual attendance for the 12 meetings is five meetings attended. They also reported that more than 71 (80%) of them found the meeting timing convenient, *which is quite astonishing*, considering the difference in timing between the United States and Iraq. For the frequency of the meetings of once monthly, 69 (82.1%) found it fitting. Similar results were found for the duration of the meeting; 79 (94%) described their impression as suitable for them.

### Consolidating the research skills

The research was the main stem of SNI-B meetings. Dr. Lazareff designed a series of lectures on how to generate research ideas from clinical observations. About 91% (77, 91.7%) of the attendees realized the high-quality research lectures. They increased their ability to present research projects to 92.9% in 78 participants, generation of ideas up to 77.4% in 65 attendees, and overall ability to conduct a research project to 66.5%. Moreover, 67 (79.7%) of the students found that the discussion level was challenging after the meetings or the lectures on the topics related to the research. This finding led the SNI-B team to change and prepare for the well-suited level of discussion. On the other hand, the survey opened the door for further changes and showed the utility of ongoing evaluation.

### Knowledge in neurosurgery

This was emphasized by the lectures of Dr. Ausman about the history of neurosurgery in the United States, his work as a neurosurgeon, and a discussion of regular and challenging cases. These lectures inspired medical students and residents to present neurosurgical cases for discussion. In this survey, 75 (87.3%) rated Dr. Ausman's lectures as beneficial material with excellent content. Consequently, various topics were presented, making the basis for ongoing neurosurgery learning. About 88% of 74 (88.1%) found the presentations valuable and enjoyable. They reported that more than 75% of the responders' knowledge has increased and improved in surgical anatomy and neuroimaging. These data may indicate the significance of continued meetings to affirm the current medical knowledge and attain consistent bilateral discussions in neurosurgery that includes all levels, from medical students to attending neurosurgeons.

## DISCUSSION

The heterogeneity of the attendees of the SNI-B meeting was remarkable. They represented medical schools from all over the country. This diversity sets the stage for exchanging

**Table 2:** The numbers and the percentages are according to the survey questions.

Survey Questions	Satisfaction				
	n (%) of 0*	n (%) of 1*	n (%) of 2*	n (%) of 3*	n (%) of 4*
<b>General aspect</b>					
How convenient is the timing of the meetings?	0 (0)	1 (1.2)	12 (14.3)	35 (41.7)	36 (42.9)
How convenient is the duration of each meeting?	0 (0)	1 (1.2)	4 (4.8)	27 (32.1)	52 (61.9)
How suitable is the frequency of the meetings (once monthly)?	0 (0)	4 (4.8)	11 (13.1)	20 (23.8)	49 (58.3)
<b>Research aspect</b>					
Prof. Lazareff's lectures on research?	1 (1.2)	1 (1.2)	5 (6)	21 (25)	56 (66.7)
Presentations of several medical students about research project ideas?	0 (0)	1 (1.2)	5 (6)	35 (41.7)	43 (51.2)
Discussion after each presentation or lecture?	0 (0)	1 (1.2)	1 (1.2)	20 (23.8)	62 (72.8)
Challenging the level of discussion?	1 (1.2)	2 (2.4)	14 (16.7)	27 (32.1)	40 (47.6)
Ability to generate ideas for research after attending SNI meetings?	0 (0)	2 (2.4)	17 (20.2)	32 (38.1)	33 (39.3)
Ability to conduct a literature review after attending SNI meetings?	0 (0)	4 (4.8)	25 (29.8)	31 (36.9)	24 (28.6)
Academic writing skills after attending SNI meetings?	0 (0)	7 (8.3)	24 (28.6)	32 (38.1)	21 (25)
Overall, your ability to conduct research after attending SNI meetings?	1 (1.2)	6 (7.1)	20 (23.8)	35 (41.7)	22 (26.2)
<b>Neurosurgery aspect</b>					
How do you rate the impact of Prof. Ausman's lectures about the history of neurosurgery and its development?	1 (1.2)	1 (1.2)	7 (8.3)	24 (26.6)	51 (60.7)
How did you find the case presentations by medical students?	0 (0)	0 (0)	10 (11.9)	38 (45.2)	36 (42.9)
How do you rate the discussion after the lectures or case presentations?	0 (0)	0 (0)	10 (11.9)	23 (27.4)	51 (60.7)
Is there any change in your neuroanatomy knowledge after attending SNI meetings?	1 (1.2)	1 (1.2)	14 (16.7)	35 (41.7)	31 (36.9)
Is there any change in your radiology knowledge (computed tomography scan) after attending SNI meetings?	1 (1.2)	3 (3.6)	18 (21.4)	24 (28.6)	38 (45.2)
Is there any change in your surgical anatomy knowledge after attending SNI meetings?	1 (1.2)	2 (2.4)	20 (23.8)	28 (33.3)	33 (39.3)
<b>Capacity-building</b>					
Is there any change in your ability to present a project or case?	1 (1.2)	4 (4.8)	16 (19)	32 (38.1)	31 (36.9)
Is there any change in the network of your international connections?	6 (7.1)	8 (9.5)	18 (21.4)	25 (29.8)	27 (32.1)
How do you rate the impact of the SNI meeting on your future planning?	0 (0)	0 (0)	12 (14.3)	25 (29.8)	47 (56)

\*Strongly disagree or very bad to strongly agree or excellent

innovative and outstanding ideas in a rich environment. The high attendance at such virtual meetings being so consistent is unique. All these findings in this survey suggest the motive for attending such meetings: a passion for learning and a love to share the best of each culture.

Developing the capacity of the medical students to present a case or a research project publicly with confidence is one of the goals of the SNI-B project. After more than 10 students presented their projects through the meeting, other students wanted to establish such skills and develop their confidence to give lectures to others. Sixty-three (76%) of the students stated that their ability to present a project had surged recently after attending the meetings. At the same time, 72 (85.8%) of the participants reported that these meetings have changed their career planning and added the experience of strategic thinking to advance their professions. Such meetings give an inspiring message to medical students that they can achieve their goals with the proper planning and skills and can build their capacity to attain these goals in the future.

### Historical perspective

For the readers of this paper, some knowledge of the background of Baghdad and Iraq is helpful in understanding the scope of the educational challenge. Mesopotamia, "the land between the two rivers," now called Iraq and is located between the Tigris and Euphrates rivers and was the first major civilization that developed in the world 10,000 years ago.<sup>[10]</sup> History began at Sumer with 39 firsts in recorded history.<sup>[6]</sup> The region near the rivers, which supplies water and a commerce route to many countries in the Middle East, was good for farming and food production and became the crossroads of civilization. Iraq emerged in the 8<sup>th</sup> century to be the center of a prosperous and expanding empire and civilization that drew on traditions of its immediate predecessors, the Greeks and the Persians, and then formed the emerging Arab Islamic culture.<sup>[7]</sup> Baghdad had the first medical school, libraries, irrigation systems, architecture, commerce, and cultural developments such as music, dance, art, and painting.<sup>[10]</sup> The region was occupied by many tribes over centuries, including the Persian, Greek, Egyptian, Roman,

Mongolian, and Turkish-Ottoman Empires. The population of Iraq is now about 40 million, with a median age of 20. Thus, half of the population is under 20 years of age. Only 7.5% are over 55 years of age. About 70% of the population lives in urban areas. Its population is expected to grow to 75.5 million in 30 years and reach over 100 million by 2100. About 80% of the population is literate,<sup>[8]</sup> likely reflecting its position as the center of learning in the past 8–10,000 years. Seven million people live in Baghdad, while a 1–2 million each live in Basra in the South and Mosul in the Northwest. The remainder of the population is mostly in the northern and eastern parts of the country.<sup>[8]</sup>

The birth rate in Iraq is almost four per woman, which surpasses most of the European countries, Russia, and China, all of which face declining populations in the future. Life expectancy is 75 years. Arabic, Kurdish, Iraqi Turkmen, and Assyrian/Chaldean are its languages reflecting the dominant influences of the cultures that occupied the country and its regions over centuries.<sup>[9]</sup> About 5% of the GDP is spent on health care. Modern Iraq's borders were determined by the British Mandate for Mesopotamia in 1920 under the authority of the League of Nations.<sup>[10]</sup> Many local wars have continued since that time among ancient tribes for whom the dictated boundaries are not acceptable. Iraq is bordered by Turkey, Syria, Jordan, Saudi Arabia, Kuwait, and Iran.<sup>[10]</sup>

Iraq is a rapidly growing country with a young population that is expected to more than double in size by 2100, with the need for peace and time to educate its population in the 21<sup>st</sup> century, having a tradition of great history as the Center of Civilization.<sup>[8,10]</sup> There is about one neurosurgeon for each 200,000 population, and unfortunately, some have left the country for safety.<sup>[4]</sup> This brain drain must be stopped nationally. History has shown that it is impossible for any civilization to survive with the loss of its best people. Its education systems were severely affected by the past 40 years of war. How can we reach people like those in Iraq to help them achieve higher levels of Medical and Neurosurgery care? The program described above is one answer to resolving that challenge. It appears popular with the young who are searching for knowledge, wisdom, and experience. Yet, the programs appear to transcend the boring, one-way lectures that populate the internet around the world. Is there something more that people want in education to provide inspiration and stimulation? The attendees believe so. They want hope for the future, the opportunity to dream for a better world, inspiration, and outstanding mentors.<sup>[4]</sup> Read the results of the recent 15<sup>th</sup> SNI-B national meeting for more insight into the solution to the educational challenge for the developing countries.<sup>[4]</sup> The youth is the future of every country and in medicine and neurosurgery. These types of educational programs have the chance of reaching large numbers of people with worldwide participation. Free and open discussions will help many adapt to the rapid changes

of the future, which are challenging to all, and to understand the differences among people, which can be resolved through this type of communication.

### **Fundamental principles of our vision**

To succeed, one must have goals for the future and work in a logical, planned manner to achieve these goals. Persistence and determination, as shown by Iraqi neurosurgeons in the 15<sup>th</sup> SNI-B meeting, are important in progressing.<sup>[4]</sup> Free and open discussions of objective data to reach reasonable conclusions with the widest possible audience of people and minds have the highest chance of success in any culture, as shown by these meetings. Good religious principles leading to a culture that values honesty and excellence provide the best environment for achieving goals. “Do unto others as you would want done unto you,” the Golden Rule is fundamental to all successful societies. As learned in the 15<sup>th</sup> SNI-B meeting, money is not central to creativity or imagination.<sup>[4]</sup> As has been shown, there are already neurosurgeons in Iraq whose innovative skills are among the best in the world.<sup>[4]</sup> To have a bright future, one must build on the best in your heritage and in each other. Step by step, each day, that bright future will happen, and you will reach your dreams.

## **CONCLUSION**

The SNI-B meetings have been a beneficial learning experience for both parties. Research skills, neurosurgery knowledge, and capacity-building experiences have been properly shared and discussed in the meetings. Such an experiment can be the prototype for replication anywhere in the world.

### **Authors' contributions**

The major part of this report was contributed by the attendees at the meeting and Dr. Hoz's trainees, including Mustafa Ismail, Aktham O. Al Khafaji, Teeba A. Al-Ageely, Zainab I. Abdualmurtafi, Sadik K. Daily, and Fatimah Ayad. Parts of the discussion were contributed by Dr. Kahlili, Dr. Lazareff, J. R., and Dr. Tarun Arora.

### **Declaration of patient consent**

Patient's consent not required as there are no patients in this study.

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Nil.

### **Conflicts of interest**

There are no conflicts of interest.

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## Commentary

Reading with interest this survey performed by Dr. Hoz's research group evaluating the educational efforts started in Iraq recently. The pioneer of such international teaching programs has been Prof. Ausman, the famous mentor, teacher, researcher, and neurosurgeon. Such an idea has been the aim of WFNS also for long period of time streaming up and down according to the financial powers and efforts of each of the presidents of WFNS. I would like to mention some basic points regarding the infra-structural armamentarium for establishing a developing, ongoing, and perhaps stable program.

- Knowledge transfer, challenges in different neuroscientific issues, attracting the young neuroscientists/neurosurgeons to get involved in the discussions and presenting new ideas, preventing burn out syndrome to develop in every society especially in the 3<sup>rd</sup>. world and low-income communities who are under daily increasing insecure conditions
- The context and basement of a society which is going to be re-established can be different when a manager considers a) population with LSEC but stable and b) the community still in WAR or just after WAR or anyhow UNSTABLE socioeconomically. c) this is still different in a society which is partly/somehow stable politically and socioeconomically.
- A Likert scale is a psychometric scale used to represent people's opinions and attitudes to a topic or subject matter during research.
- This research needs the minimum of good internet coverage with acceptable downloading speed to have a good international communication not demanding VPN system.
- Training program in neurosurgery is quite different from pediatrics and I think Dr. Lazareff might agree with me.
- Even though the medical students and residents would have been willing to discuss the issues with professors over the world but the application of the outputs to their own problems might neither be possible or plausible. The kind researchers may be aware of the issue of brain drainage from the 3<sup>rd</sup>. world growing up every year. Getting familiar with the facilities in the 1<sup>st</sup> world might be another reason for such a drainage!
- Performing international teaching programs using web-based sessions between the experienced international mentors and teachers on one side and young enthusiastic residents and fellows as settled down in Iraq is certainly productive and better to be recruited in other centres capable of maintaining the basic elements in any of the mentioned situations.

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