

Clinical Elective Course and Its Effects on Medical Students and Graduates of Jordanian Medical Schools

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Abstract

Background: Elective course is one of 6th-year medical schools curriculum in Jordan. Students choose the specialty they wish to spend 8 weeks in and choose the place even if it is outside their university's affiliated hospitals. In this study, we try to understand students' choices regarding the country of elective, their specialty, type of placements (observership/ clerkship), and participants' perspectives about the elective course and its general value.

Methods: Cross-sectional study. The survey distributed through social media platforms (mainly Facebook and Whatsapp) targeting 6th-year medical students and doctors who graduated from one of the 5 Jordanian medical schools (the University of Jordan, Jordan University of Science and Technology, Mutah University, Yarmouk University, Hashemite University).

Results: The majority of participants had international elective (69.6%), mainly in the USA followed by the UK. Internal medicine was the field of interest for 14.8%, followed by general surgery 11.2%. 241 (62.6%) actively participated in the elective as they had a clerkship/ hands-on experience. In contrast, 142 (36.9%) were observers. The majority indicated that the elective is worth time, money, and effort. Moreover, they had adequate supervision throughout the course and could achieve their preset objectives.

Conclusions: the elective course gives a unique experience to our students. The general satisfaction is an indicator of the success of the course in exposing medical students to clinical practice actively.

1. Introduction

Clinical elective is one of the medical schools' curriculum courses, usually part of the last year's medical school program. It is an elective course in terms of specialty chosen, country, and institution [1].

The Elective course has many valuable perspectives and is universally well-received by students [2]. Clinical elective course aided most undergraduate students to have a clear insight into their future postgraduate specialty [3] [4]. Students in their clinical elective can be either passive observers or actively involved in multiple aspects of care and tasks, including clinical assessment, care management, or participation in invasive procedures [5].

A significant proportion of medical students worldwide participate in enriching, usually self-organized, clinical electives outside their home country, known as international clinical electives or global health electives. International electives showed a significant improvement in many perspectives, including personal, professional, and academic levels [6].

The international elective experience contributed favorably to student learning and career growth in several ways. Firstly, helping significantly in strengthening the existing skills and learning new diagnostic skills. Secondly, report attitudinal changes and ethical learning, such as a greater appreciation of the

importance of cross-cultural communication. Third, it influences the career choices of many medical students [7].

Clinical electives provide many benefits to medical students, but not all students get through the same experience, and some find the elective course a waste of money, time, and effort. Clinical elective course in schools of medicine in Jordan takes around 8 weeks of the last academic year of medical school. However, its effects have not been studied or reviewed by medical school directors. Moreover, students' feedback, struggles, and drawbacks have not been evaluated. Therefore, this study attempts to understand students' preferences, including preferred specialties, countries, and locations, and assess general satisfaction with elective course experience among Jordanian medical students and graduates. In this way, we can make a clearer image of the advantages and disadvantages of this course to make a baseline for future improvement.

2. Methodology

Study design

This is a cross-sectional study targeting 6th-year medical students in Jordan (class of 2020) and graduates of Jordanian medical schools (class of 2019 and before). The students and physicians who took part in this study were assessed using an online questionnaire survey in English that included quantitative questions and two qualitative questions. The questionnaire was distributed on social media (Facebook, WhatsApp) to Jordanian medical groups in Google format. All health care workers and a class of 2020 medical students were invited to participate in this survey. Informed consent from each respondent was taken before proceeding with the questionnaire.

Instrumental Development

The questionnaire consists of informed consent as a first part, followed by six demographic-related questions (gender, age, university of graduation, year of graduation, current position, and if the elective was international or national). Six questions address various aspects of the expected benefits of the elective course and solicit responses from students on a 5-point Likert scale ranging from 0-strongly agree to 4-strongly disagree. In addition to one question to assess the overall value of the elective, from 0-experience of no value to 5-experience of great value. Participants who took national electives managed to skip some questions directed to international electives automatically and vice versa. At the end of the questionnaire, there were two open-ended questions.

Data Analysis

Data were analyzed using SPSS version 23. Questionnaire items were reported as frequency (percentage). Mean and standard deviation was used for age, general evaluation of elective from participants' perspective out of 5, and level of satisfaction of each of the six items in table 3 on a scale rating 0-is the minimum- to 4 -is the maximum- (0-strongly disagree, 1-disagree, 2- neutral, 3- agree, and

4-strongly agree). Kruskal Wallis test was used to find the correlation between the 6-item ratings and the 5-point scale for the general value of elective in Table 2. A P-value of less than 0.05 was considered significant. Crosstables were used to understand better the relation between Placement Location (national or international) and Type of Placement (observership or clerkship) with the General Value of Elective. National elective participants' responses were excluded while measuring general value of elective among international elective participants in table 4 and vice versa using "select cases; if" option in SPSS.

Ethical Consideration

The Institutional Review Board (IRB) approval was obtained at the University of Jordan in May 2020. Participation in this study was voluntary, and as mentioned clearly in the preface, "completion and submission of this form is considered an approval to participate." All information gathered during the course of this study was confidential, and participants' anonymity was protected at all times. No questions were asked about the participant's name or other personal information that could reveal the participants' identity. In addition, only the research team members were allowed to review the participants' responses.

Election criteria

- Participants > 20 years old
- Medical school graduates and 6th - year medical students of one of the six Jordanian medical schools (University of Jordan, Hashemite University, Yarmouk University, Mutah University, Jordanian University for Science and Technology).
- Class of 2020 and earlier.
- Participation from 21/05/2020 to 01/12/2020

Exclusion Criteria

1. Participants < 20 years old.
2. 1st, 2nd, 3rd, 4th, 5th - year medical students.
3. Graduates and medical students at non-Jordanian medical schools.
4. Class of 2021 and beyond
5. Participation after 01/12/2020

3. Results

3.1 Demographics and Elective Setting

A number of 385 participants from different levels of experience filled the questionnaire. Table 1 shows that the mean age of the participants is 26.31 ± 4.072 years. The majority, 122 (31.7%), was last year's

medical students, followed by interns 118 (30.6%), residents, general practitioners, specialists, consultants, and fellows, all of whom graduated before 2021. Of which, 214 (55.6%) were male and 171 (44.4%) were female. Overall, 35.6% of all participants studied at the University of Jordan. Most of the participants enrolled in an international elective 268 (69.6%) compared to 117 (30.4%) national electives.

Table 1
Table of Demographics

| factor | Category | Frequency (%) | Mean ± SD |
|--------------------------|---------------------------------------------|---------------|-----------------|
| Age | 23 | 47 (12.2%) | 26.31± 4.072 |
| | 24 | 125 (32.5%) | |
| | 25 | 86 (22.3%) | |
| | 26 | 30 (7.8%) | |
| | 27 | 15 (3.9%) | |
| | 28 | 8 (2.1%) | |
| | 29 | 11 (2.9%) | |
| | 30 | 8 (2.1%) | |
| | > 31 | 55 (14.3%) | |
| Gender | Female | 171 (44.4%) | |
| | Male | 214 (55.6%) | |
| University of Graduation | University of Jordan | 137(35.6%) | |
| | Jordan University of Science and Technology | 97 (25.2%) | |
| | Hashemite University | 86 (22.3%) | |
| | Yarmouk University | 40 (10.4%) | |
| | Mutah University | 25 (6.5%) | |
| Year of Graduation | < 2015 | 64(16.6%) | |
| | 2015 | 10 (2.6%) | |
| | 2016 | 4 (1.0%) | |
| | 2017 | 7 (1.8%) | |
| | 2018 | 27 (7.0%) | |
| | 2019 | 123 (31.9%) | |
| | 2020 | 150 (39.0%) | |
| Current Position | Last-Year Medical Student | 122 (31.7%) | |
| | Intern | 118 (30.6%) | |
| | General Practitioner | 44 (11.4%) | |

| | | |
|---------------------------|---------------|-------------|
| | Resident | 49 (12.7%) |
| | Specialist | 29 (7.5%) |
| | fellow | 8 (2.1%) |
| | Consultant | 15 (3.9%) |
| National or International | Inside Jordan | 117 (30.4%) |
| | Abroad | 268 (69.6%) |

Table 2 summarizes the elective choices, such as the type of placement, specialty chosen, the number of placements enrolled during the elective course's duration, the location of national electives or the country of international electives, and the method of obtaining the placement. 241 (62.6%) did clerkship placement, while 142 (36.9) were observers. Placements were in more than 40 specialties. The majority of them, 57 (14.8%), were in internal medicine, followed by general surgery of 43 (11.2%) (Figure1). The vast majority did more than one placement. For example, 134 (34.8%) did their first international placement in the United States of America, followed by 31 (8.1%) in the United Kingdom, then Germany in third place of 23 (6%) participants. On the other hand, for those who had national electives 43 (11.2%) did their first placement at Ministry of Health hospitals, followed by 34 (8.8%) at the Royal Medical Services. Direct application to the concerned hospital helped 192 (49.9%) in getting placement, while 106 (27.5%) guaranteed placement using connections (through friends or relatives).

Table 2
General idea about the Elective choices

| | Category | Frequency (%) |
|--------------------------------------------------------------|----------------------------------------------|----------------------|
| Type of the placement | Observership | 142 (36.9%) |
| | Clerkship/Hands-on | 241 (62.6%) |
| The way of getting the placement | Connections through friends or relatives | 106 (27.5%) |
| | Exchange programs | 32 (8.3%) |
| | Arrangement through home university | 41 (10.6%) |
| | Arrangement with profit-organization | 11 (2.9%) |
| | Direct application to the concerned hospital | 192 (49.9%) |
| | IFMSA | 1 (0.3%) |
| | Chicago Clerkship | 1 (0.3%) |
| | What specialty were you in? | Cardiology |
| Emergency Medicine | | 20 (5.2%) |
| General Surgery | | 43 (11.2%) |
| Internal Medicine | | 57 (14.8%) |
| Orthopedics | | 21 (5.5%) |
| Pediatrics | | 26 (6.8%) |
| All other specialties | | 183 (47.4%) |
| number of placements international elective | | 1 |
| | 2 | 144 (37.4%) |
| | > 3 | 16 (4.2%) |
| Country of placement¹ for aboard electives | Germany | 23 (6%) |
| | Kuwait | 7 (1.8%) |
| | United Arab Emirates | 14 (3.6%) |

| | Category | Frequency (%) |
|-------------------------------------------------------------|-------------------------------------------|----------------------|
| | United Kingdom | 31 (8.1%) |
| | United States | 134 (34.8%) |
| | All other countries | 53 (13.9%) |
| Country of Placement #2 international elective | Germany | 15 (3.9%) |
| | Turkey | 4 (1%) |
| | United Kingdom | 10 (2.6%) |
| | United States | 85 (22.1%) |
| | other countries | 22 (6%) |
| Number of placements completed for national elective | 1 | 51 (13.2%) |
| | 2 | 53 (13.8%) |
| | > 3 | 13 (3.6%) |
| Location of Placement #1 for national electives | Jordan University Hospital | 13 (3.4%) |
| | King Abdullah University Hospital | 14 (3.6%) |
| | King Hussein Cancer Center | 1 (0.3%) |
| | Private Hospital | 5 (1.3%) |
| | Public Health Center (Ministry of Health) | 7 (1.8%) |
| | Public Hospital (Ministry of Health) | 43 (11.2%) |
| | Royal Medical Services | 34 (8.8%) |
| Location of Placement #2 for national elective | Jordan University Hospital | 7 (1.8%) |
| | King Abdullah University Hospital | 2 (0.5%) |
| | Private Hospital | 2 (0.5%) |
| | Public Health Center (Ministry of Health) | 5 (1.3%) |
| | Public Hospital (Ministry of Health) | 32 (8.3%) |
| | Royal Medical Services | 17 (4.4%) |

Table 3

Participants Satisfaction about their Elective Experience

| Items | Strongly disagree, n (%) | Disagree, n(%) | /Neutral, n(%) | Agree, n(%) | Strongly Agree, n(%) | P-value | Mean \pm SD |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------|----------------|-------------|----------------------|-----------|------------------|
| 1 I had adequate supervision during clinical elective | 13 (3.4) | 33(8.6) | 64(16.6) | 158(41) | 117(30.4) | (< 0.001) | 2.86 \pm 1.05 |
| 2 I had adequate opportunities for hands-on clinical work (e.g., active involvement in the wards, clinics or operations, case presentation, Etc.). | 13(3.4) | 42(10.9) | 78(20.3) | 121(31.4) | 131(34) | (< 0.001) | 2.82 \pm 1.12 |
| 3 The elective provided me active learning through discussion/ participation | 11(2.9) | 21(5.5) | 63(16.4) | 161(41.8) | 129(33.5) | (< 0.001) | 2.98 \pm 0.988 |
| 4 The program was responsive to my needs (both academically and socially) | 10(2.6) | 36(9.4) | 69(17.9) | 161(41.8) | 109(28.3) | (< 0.001) | 2.84 \pm 1.023 |
| 5 The elective worth the time, effort and money | 12(3.1) | 35(9.1) | 58(15.1) | 136(35.3) | 144(37.7) | (< 0.001) | 2.95 \pm 1.081 |
| 6 I was able to achieve the objectives I had set for myself. | 9(2.3) | 36(9.4) | 99(25.7) | 152(39.5) | 89(23.1) | (< 0.001) | 2.72 \pm 0.998 |

3.2 The General Value of Elective

Table 3 illustrates 6 items used to evaluate the value of the elective in general, which shows positive responses to the 6 questionnaire items. At the end of these items, participants were asked to evaluate the General Value of Elective. 69.2% evaluated their experience ≥ 4 out of 5 with mean (\pm S.D.) of 3.87 (\pm 1.207) Fig. 2. The correlation between these 6 items and the participants' evaluation of the general value of elective is significantly correlated with P-value < 0.001 for all the items using the Kruskal Wallis test in Table 3.

3.3 General Value of Elective and Type of placement/ Location of Placement

A comparison between the national and international general value of electives as rated by the participants in (Table 4). 81.3% of international elective participants evaluated their experience ≥ 4 out of 5 with mean of 4.20 (\pm 0.985), compared to 47% of national elective participants with mean of 3.15 (\pm 1.347). Regarding the type of placement (Table 5), 78% of those who did Clerkship/hands-on experience had valuable experience, and 77% of observership participants.

Table 4
Correlation between the location of elective and its general value

| | General Value of Elective (0-0 value at all, 5- great value) | | | | | | Total | Mean (\pm SD) | P- value |
|------------------|--------------------------------------------------------------|--------------|---------------|---------------|----------------|----------------|---------------|---------------------------|-------------|
| | 0 | 1 | 2 | 3 | 4 | 5 | | | |
| Inside Jordan | 7 (6%) | 7 (6%) | 16 (13.7%) | 38 (32.5%) | 30 (25.6%) | 19 (16.2%) | 117 (100%) | 3.15 (\pm 1.347) | < 0.001 |
| Abroad | 1 (0.4%) | 5 (1.9%) | 13 (4.9%) | 31 (11.6%) | 92 (34.3%) | 126 (47%) | 268 (100%) | 4.20 (\pm 0.985) | |
| Total | 8 (2.1%) | 12 (3.1%) | 29 (7.5%) | 69 (17.9%) | 122 (31.7%) | 145 (37.7%) | 385 (100%) | 3.87 (\pm 1.207) | |

Table 5

correlation between the type of elective and the value of its general value

| General Value of Elective (0–0 value at all, 5- great value) | | | | | | | | |
|--------------------------------------------------------------|-------------|--------------|---------------|---------------|----------------|----------------|---------------|------------|
| | 0 | 1 | 2 | 3 | 4 | 5 | Total | P-value |
| Observership | 5 (3.5%) | 7 (4.9%) | 16 (11.3%) | 37 (26.1%) | 46 (32.4%) | 31 (21.8%) | 142 (100%) | < 0.001 |
| Clerkship/Hands-on | 3 (1.2%) | 5 (2.1%) | 13 (5.4%) | 32 (13.3%) | 75 (31.1%) | 113 (46.9%) | 241 (100%) | |
| Total | 8 (2.1%) | 12 (3.1%) | 29 (7.6%) | 69 (18%) | 121 (31.6%) | 144 (37.6%) | 383 (100%) | |

3.4 Qualitative Analysis

One hundred fifty-seven participants responded to the first open question, while only 87 to the second. Some answers to these open-ended questions were repetitive to already measured items in the 5-point Likert score questions.

Responds to the first open-ended question, "**What advice do you have for undergraduates who want to do an elective abroad?**". Almost all responses encouraged abroad elective experience; however, only 5 negative impressions about abroad clinical elective were expressed among 157 responses, and the main barrier in their issue was that it was not worth the cost, followed by the language barrier. Most frequently repeated advice to undergraduates: take the risk and go abroad, set objectives beforehand, be initiative, plan it as early as you can. Some other advice on the location and the specialty choices, such as: choose elective in the country you are planning to have your training in the future, and in the specialty you prefer, try not to spend the whole duration of elective in the same department or institution, apply to as many institutions as possible, and accept rejections and do not fear being rejected.

For the second question, "**Do you have any other points you would like to add?**" For example, many respondents wonder why they have to pay the university fees for 8 credit hours when they are not taught at the university's hospital. Moreover, another point has been emphasized by the Hashemite's graduates regarding restrictions in selecting only 2 months for all student to start their elective course that resulted in a significant obstacle in getting appropriate chances. Others argue that faculties should contribute financially to student support and provide more opportunities and affiliations.

4. Discussion

Thousands of Jordanian medical students participate in "elective" courses each year, which are calculated as 8 credit hours as part of the faculty's scheduled study plan; some schools limit the students

to specific months during the sixth year, while others allow students to arrange their elective course at any time during the final year in a duration of 8 weeks. At the time of the study, the Applied Al-Balqa University's medical school. The elective is the best way in which students can practice the disciplines of their interests. [1]

Our study aims mainly to evaluate the value of the clinical elective and identify factors that contribute to making the differences in students' experiences and understand how students can take the most advantage of this opportunity. Furthermore, familiarizing the student with the diverse available opportunities and introducing them to the process of applying, enrolling, and preparing for attending the concerned course leads to ameliorating students' learning experience to its optimal [8].

The elective course's effectiveness was measured in many universities in the USA, Canada, Netherlands, Saudi Arabia, UK, and other countries, which showed significant benefits. Also, in these studies, they could have spotted some defects that might be reconsidered. Unfortunately, in Jordan, there are no such studies that help us to understand and evaluate the value of the elective course for medical students in Jordan and how it can be improved to achieve the desired objectives[7][9][10] [3]. In this study, we evaluated the general value of the elective using 6 items (Table 3), a significant correlations between these items and the general value of the elective course were identified.

To align their curriculum vitae, elective specialty choices are usually the same as their preferred specialty as their planned future postgraduate training program specialty. Van Den Broad et al., 2017 showed that the most popular career interest among medical students is internal medicine and its subspecialties (n = 33; 21.6%) followed by family medicine (n = 30; 19.6%), and surgery (n = 24; 15.7%). In our study, the most popular selected elective courses were general Internal medicine (14.8%), followed by general surgery (11.2%), cardiology 35 (9.1%), and pediatrics with (6.8%). Many students choose a clinical elective in surgery or internal medicine because they are broad with many subspecialties and training in these fields can benefit other careers/specialties as well [11].

Among our participants, 62.6% had clerkship/hands-on experience in comparison to 36.9% with observership experience. As clerkship helps students participate actively with physicians and patients in the specialty of their interest, it then benefits specialty choice exploration and increases professionalism in practicing medicine and increasing self-efficacy [12]. Surprisingly, direct application to the concerned institution was the primary method of getting placement for 142 (49.9%) students, followed by connections (27.5%).

A total of 117 (30.4%) participants participated were engaged in a national elective of which 43 (11.2%) selected ministry of health hospitals for their elective courses. This can be attributed to the distribution of ministry of health affiliated hospitals in all provinces of Jordan. In comparison, 268 (69.6%) of participants had international electives, of which 134 (34.4%) were in the USA. Almost all of the responses to the open-ended question regarding the advice for selecting an elective strongly encouraged pursuing an international elective rather than a national one. Reasons behind this are not limited to the medical experience but also related to cross-cultural acceptance from a broader perspective. For example,

Queen's University in Canada concluded that the international electives benefit medical students' professional and personal development [6]. Some consider it a "must" to travel internationally. In contrast, others emphasize breaking out of one's comfort zone and venturing out to discover the world and learn medicine in a new way, culturally competent and sensitive well as having exposure to global health issues is needed among today's trained physicians which will help in understanding existing and newly emerging global diseases [13].

The USA ranked first among the most favorable countries where students prefer to spend their electives. This can be attributed to professional opportunities, attractive training environment, or political stability [14]. In fact, students participating in observerships, externships or research activities in the USA have the advantage to undertake the USMLE step 2 clinical skill exam and increase their competitiveness when applying for residency programs in the future. However, in response to the COVID-19 pandemic, the USMLE step 2 clinical skill exam has been stopped [15] [16].

In responding to the open-ended questions, participants showed a high level of awareness, responsibility and maturity. Almost all of them encouraged undergraduate students to invest their time during elective efficiently and not to consider it only as a vacation. Many of the responders to the second open-ended question admit that financial burden is considered a major barrier for many students to enroll in an international elective. They recommended that their schools adopt more flexible policies regarding the timing of elective enrollment and sign agreements with different international medical schools and centers, allowing them to secure elective positions in the future.

5. Limitation

The study utilized an online questionnaire, so we could not grant that we only received one response per participant, and the questionnaire was mainly distributed amongst Jordanian graduates currently working in Jordan. Students usually tend to do electives in more than one place, and each carries a different experience and value. So, in this study, we measured the impact of one of the participants' experiences. The results were for both international and national elective and no clear comparison between both was performed. More data on cultural and professional development after elective should be made. Moreover, the qualitative study was based on open-ended questions instead of interviewing the participants.

6. Conclusion

The elective course provided medical graduates with an enriching environment and cultural experience. The international elective is highly preferable by medical students, especially those who intend to complete their residency abroad. Medical schools are required to adopt more flexible policies regarding timing of elective engagement and build a network of international affiliations to enhance students' opportunities to secure elective positions.

Abbreviations

IFMSA International Federation of Medical Students' Associations

IRB The Institutional Review Board

N Frequency

S.D. Standard Deviation

UK United Kingdom

USA United States of America

USMLE The United States Medical Licensing Examination

Declarations

Ethics approval and consent to participate

The Institutional Review Board (IRB) approval was obtained at the University of Jordan in May 2020. Participation in this study was voluntary, and as mentioned clearly in the preface, "completion and submission of this form is considered an approval to participate." All information gathered during the course of this study was confidential, and participants' anonymity was protected at all times. No questions were asked about the participant's name or other personal information that could reveal the participants' identity. In addition, only the research team members were allowed to review the participants' responses.

Consent for publication

Not applicable

Availability of data and material

The data that support the findings of this study are available on request from the corresponding author RAA. The data are not publicly available because that could compromise research participant consent.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

RAT was the general supervisor, responsible for tasks distribution, reviewed and submitted proposal for IRB and reviewed survey questions. RAA wrote proposal for IRB approval, survey questions, conceived and designed the analysis, analyzed the data, interpreted data, wrote results and discussion, and was responsible for publishing. AAA wrote the introduction, helped write the proposal for IRB approval, contributed to established survey questions and wrote methodology. MR was responsible for data collection from University of Jordan and checkup of references. AM data collection from Jordan University of Science and Technology. EA collection at the Mutah University, HamzehAB data collection in Hashemite University. HasanAB data collection at the Yarmouk University. MAB data collection at the Hashemite University. MA responsible for data collection. NQ data collection at Hashemite University. All authors have reviewed survey material and all authors have read, reviewed, edited and approved the final version of the manuscript.

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References

1. A. Lumb and D. Murdoch-Eaton, "Electives in undergraduate medical education: AMEE guide No.88," *Medical Teacher*, vol. 36, no. 7, pp. 557-72, 2014. doi: [10.3109/0142159X.2014.907887](https://doi.org/10.3109/0142159X.2014.907887)
2. A. Agarwal, S. Wong, S. Sarfaty, A. Devaiah and A. E. Hirsch, "Elective courses for medical students during the preclinical curriculum: a systematic review and evaluation," *Medical Education Online*, vol. 20, no. 1, 2015. doi: [10.3402/meo.v20.26615](https://doi.org/10.3402/meo.v20.26615)
3. W. van den Broek, M. Wijnen-Meijer, O. Ten Cate and M. van Dijk, "Medical students' preparation for the transition to postgraduate training through final year elective rotations," *GMS Journal for Medical Education*, vol. 34, no. 5, p. Doc65, 2017. doi: [10.3205/zma001142](https://doi.org/10.3205/zma001142)
4. G. Wellstead, K. Koshy, K. Whitehurst, B. Gundogan and A. J. Fowler, "How to organize a medical elective," *International Journal of Surgery. Oncology*, vol. 2, no. 6, p. e28, 2017. doi: [10.1097/IJ9.000000000000028](https://doi.org/10.1097/IJ9.000000000000028)
5. Woolley, C. Ian J., W. Nicholas and D. Ashley, "Healthy, safe and effective international medical student electives: a systematic review and recommendations for program coordinators," *Trop Dis Travel Med Vaccines*, vol. 5, no. 4, 2019. doi: [10.1186/s40794-019-0081-0](https://doi.org/10.1186/s40794-019-0081-0)
6. D. Stys, W. Hopman and J. Carpenter, "What is the value of global health electives during medical school?," *Medical Teacher*, vol. 35, no. 3, pp. 209-18, 2012. doi: [10.3109/0142159X.2012.731107](https://doi.org/10.3109/0142159X.2012.731107)
7. M. J. Thompson, M. K. Huntington, D. D. Hunt, L. E. Pinsky and J. J. Brodie, "Educational effects of international health electives on U.S. and Canadian medical students and residents: A literature review," *Academic Medicine*, vol. 78, no. 3, pp. 342-347, 2003. doi: [10.1097/00001888-200303000-00023](https://doi.org/10.1097/00001888-200303000-00023)
8. C. Daly and J. Last, "An analysis of free-choice electives in an undergraduate medical degree," *BMC Med Educ*, vol. 17, no. 1, p. 113, 2017. doi: [10.1186/s12909-017-0955-7](https://doi.org/10.1186/s12909-017-0955-7)

9. C. Wiskin, M. Barrett, B. Fruhstorfer and M. L. Schmid, "Recommendations for undergraduate medical electives: a UK consensus statement," *Medical Education*, vol. 52, no. 1, p. 14–23, 2018. doi: [10.1111/medu.13445](https://doi.org/10.1111/medu.13445)
10. A. Fouda Neel, L. AlAhmari, R. Alanazi, K. A. T. Sattar, E. Feeley, M. Khalil and M. Soliman, "Medical students' perception of international health electives in the undergraduate medical curriculum at the College of Medicine, King Saud University," *Adv Med Educ Pract*, vol. 9, pp. 811-817, 2018. doi: [10.2147/AMEPS173023](https://doi.org/10.2147/AMEPS173023)
11. W. van den Broek, M. Wijnen-Meijer, O. Ten Cate and M. van Dijk, "Medical Student's Preparation for the Transition to Postgraduate Training through Final Year Elective Rotations," *GMS Journal for Medical Education*, vol. 34, no. 5, p. Doc65, 2017. doi: [10.3205/zma001142](https://doi.org/10.3205/zma001142)
12. L. Sheu, S. Goglin, S. Collins, P. Cornett, S. Clemons and O. PS, "How Do Clinical Electives during the Clerkship Year Influence Career Exploration? A Qualitative Study," *Teach Learn Med*, 2021. doi: [10.1080/10401334.2021.1891545](https://doi.org/10.1080/10401334.2021.1891545)
13. P. K. Drain, A. Primack, D. D. Hunt, W. W. Fawzi, K. K. Holmes and P. Gardner, "Global Health in Medical Education: A Call for More Training and Opportunities," *Academic Medicine*, pp. 226-230, 2007. doi: [10.1097/ACM.0b013e3180305cf9](https://doi.org/10.1097/ACM.0b013e3180305cf9)
14. P. Chen, M. Nunez-Smith, D. Berg, A. Gozu, S. Rulisa and L. Curry, "International medical graduates in the USA: a qualitative study on perceptions of physician migration," *BMJ Open*, vol. 1, 2011. doi: [10.1136/bmjopen-2011-000138](https://doi.org/10.1136/bmjopen-2011-000138)
15. J. Park and H. C. Rhim, "Consequences of COVID-19 on international medical graduates and students applying to residencies in the United States," *Korean Journal of Medical Education*, vol. 32, no. 2, p. 91–95, 2020. doi: [10.3946/kjme.2020.156](https://doi.org/10.3946/kjme.2020.156)
16. "Work to Relaunch USMLE Step2 CS Discontinued," 26 Jan 2020. [Online]. Available: <https://covid.usmle.org/announcements/work-relaunch-usmle-step-2-cs-discontinued>

Figures

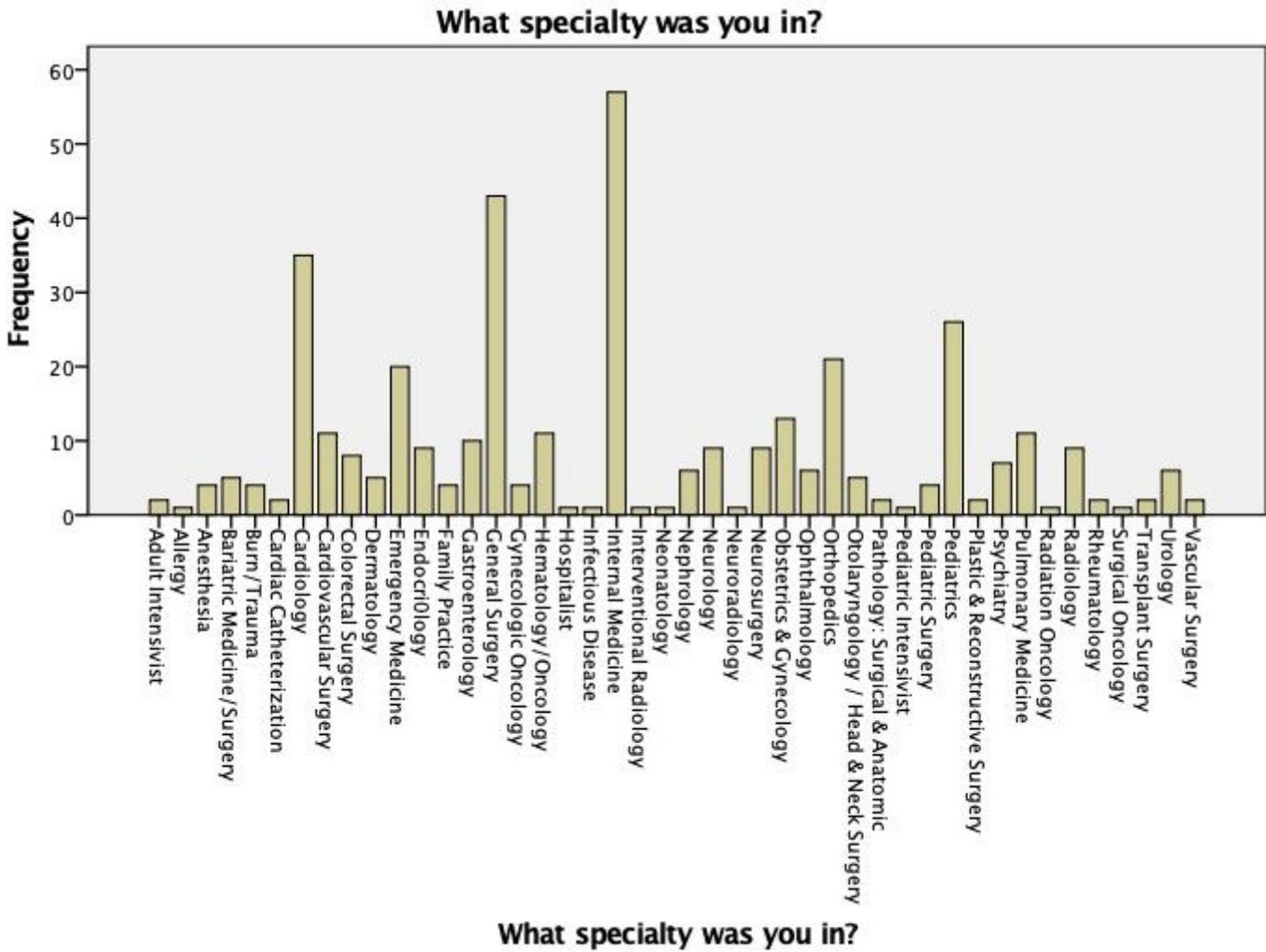


Figure 1

The frequency of chosen specialties

Value of experimental learning in general (0- 0 value at all, 5- great value)

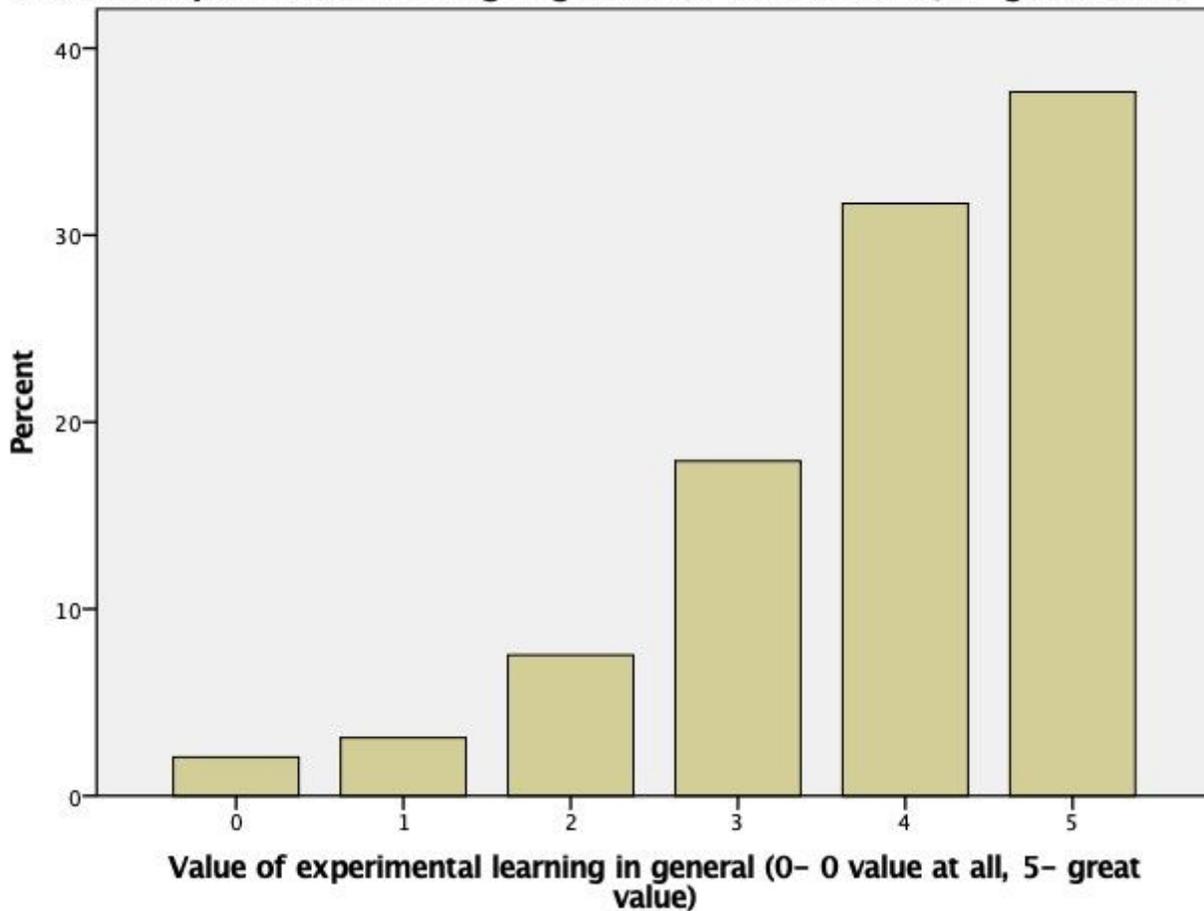


Figure 2

General value of elective from the participants' perspective on 5-likert scale (0- of no value, 5- of great value).