



Early clinical exposure in undergraduate medical education: A questionnaire survey of 30 European countries

Anne Simmenroth, Alex Harding, Odd Martin Vallersnes, Aimee Dowek, Francesco Carelli, Nino Kiknadze & Helena Karppinen

To cite this article: Anne Simmenroth, Alex Harding, Odd Martin Vallersnes, Aimee Dowek, Francesco Carelli, Nino Kiknadze & Helena Karppinen (2022): Early clinical exposure in undergraduate medical education: A questionnaire survey of 30 European countries, Medical Teacher, DOI: [10.1080/0142159X.2022.2137014](https://doi.org/10.1080/0142159X.2022.2137014)

To link to this article: <https://doi.org/10.1080/0142159X.2022.2137014>



© 2022 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



[View supplementary material](#)



Published online: 31 Oct 2022.



[Submit your article to this journal](#)



Article views: 458








[View related articles](#)



[View Crossmark data](#)

Early clinical exposure in undergraduate medical education: A questionnaire survey of 30 European countries

Anne Simmenroth^{a*} , Alex Harding^{b*} , Odd Martin Vallernes^c , Aimee Dowek^d , Francesco Carelli^e, Nino Kiknadze^f and Helena Karppinen^{g#} 

^aFaculty of Medicine, Department of Family Medicine, Universitätsklinikum Würzburg, Würzburg, Germany; ^bDepartment of Primary Care, University of Exeter College of Medicine and Health, Exeter, UK; ^cDepartment of General Practice, University of Oslo, Oslo, Norway; ^dRoyal Hampshire County Hospital, Winchester, UK; ^eFaculty of Medicine, Department of Clinical Medicine, Polo Policlinico, Milan, Italy; ^fFaculty of Medicine, Department of Family Medicine, Tbilisi State Medical University, Tbilisi, Georgia; ^gDepartment of General Practice and Primary Health Care, University of Helsinki, Helsinki, Finland

ABSTRACT

Purpose: Fifteen years ago, a European survey demonstrated widespread adoption of early clinical exposure (ECE) programmes but little emphasis in the curricula of medical schools. We now repeat the survey in light of the ample emerging data suggesting multiple positive outcomes of ECE.

Methods: Online cross-sectional survey in European medical schools conducted by the EURACT Basic Medical Education Committee in 2021. Descriptive quantitative analyses and a thematic analysis approach were used.

Results: Eighty-nine (48%) medical schools in 30 European countries responded. ECE was used in 65 (73%) of the medical schools, and 88% of ECE programmes took place in primary care. The median total time spent on the ECE programme was 5 days. Teaching methods covered unstructured learning opportunities such as observation or shadowing doctors, as well as work-based learning whilst seeing real patients or reflecting on own encounters. Learning goals included knowledge, skills, and attitudes. More than half of the respondents expressed barriers to implementing or expanding ECE.

Conclusions: Compared to the previous survey, there was no significant change in the adoption or curricular emphasis of ECE programmes. Institutional attitudes towards certain disciplines and a lack of willingness to experiment with new teaching methods may be partially responsible.

KEYWORDS

Early clinical exposure; medical curricula; undergraduate education; preclinical; Europe

Introduction

A growing body of evidence (Littlewood et al. 2005; Dornan et al. 2006; Yardley et al. 2010), demonstrates that medical students in their first two years benefit from active and even passive encounters with patients, at a time when their learning is often from books or in lectures (Tayade and Latti 2021). ECE has been shown to improve teacher motivation and satisfaction, boost patient satisfaction, enhance students' clinical skills and professional attitudes and help clarify future career choices (Alberti et al. 2017, Alberti 2018, Diemers et al. 2008). ECE also encourages students to develop an empathic and holistic attitude, a better understanding of the impact of illness, and improved self-reflection through interacting with role models (Miettola et al. 2005; Dornan et al. 2006; Diemers et al. 2008; Golden et al. 2018). Moreover, students enjoy ECE, and it increases their motivation in learning (Littlewood et al. 2005; Sathishkumar et al. 2007). Previous European surveys of ECE have shown that it is often located in primary care and organized by family medicine/general practice departments or GP teachers within or outside the


Practice points

- There is a growing body of evidence that students benefit in many ways from early clinical exposure.
- We found a wide range of teaching methods: from unstructured learning opportunities such as observation or shadowing doctors in hospitals to work-based learning whilst seeing real patients in their homes and reflecting on their own encounters.
- Attitudes (e.g. 'keeping an open mind'), knowledge (e.g. ethical principles), and basic skills (history taking, examination) suit perfectly ECE learning goals.
- ECE learning opportunities can be well implemented in primary care, due to the great variability of diseases and patients from all age groups and social contexts, if appropriately resourced.

CONTACT Anne Simmenroth  simmenroth_a@ukw.de;  www.allgemeinmedizin.uni-wuerzburg.de  Department of Family Medicine, Universitätsklinikum Würzburg, Josef-Schneider-Str. 2/D7, Würzburg 97080, Germany

*Anne Simmenroth and Alex Harding are joint first authors.

#Helena Karppinen is sole last author.

 Supplemental data for this article can be accessed online at <https://doi.org/10.1080/0142159X.2022.2137014>

This article has been corrected with minor changes. These changes do not impact the academic content of the article.

© 2022 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

medical faculties (Başak et al. 2009; Pfarrwaller et al. 2015), however, the reason for this is unclear.

During the last 15 years, there have been significant advances in some areas of undergraduate medical education. Teaching and assessment methods have become more innovative and diverse (Rees et al. 2016; Vallee et al. 2020), and e-learning formats have increased due to the COVID pandemic (Pei and Wu 2019; Dost et al. 2020). In 2006, the Basic Medical Education Committee of the European Academy of Teachers in General Practice/Family Medicine (EURACT) conducted a survey of ECE in medical schools across 16 European countries. ECE at that time was a new trend in medical schools, and they varied widely depending on faculty staff, funding, or the health care system (Başak et al. 2009).

As outlined, medical education has changed rapidly, and more than 15 years have elapsed since the last European study. An up-to-date survey was therefore commissioned by EURACT with the aims of informing teaching and policy decisions and better understanding the questions raised by the first survey.

Objectives

We aimed to give a comparative overview of ECE, how its educational aims and methods have responded to the changes in medical education provision, and to investigate the barriers to the implementation or expansion of ECE in European countries.

Methods

Design

An online cross-sectional survey in European medical schools conducted by the EURACT Basic Medical Education Committee during the spring of 2021, using Google Forms. The questionnaire was developed using standard questionnaire methodology (Oppenheim 1992) informed by a previous questionnaire on the same topic (Başak et al. 2009) and was piloted among members of the EURACT Executive Board and the EURACT Basic Medical Education Committee and subsequently refined. Results were subject to qualitative and quantitative analysis.

Sampling

Ten medical schools were invited from each EURACT member country. If there were fewer than 10 medical schools in a country, all were invited. Using the key informant technique (Gilchrist 1992), the national council members of the EURACT council sent invitations to the relevant persons at the medical schools in their country with the intention of sampling for maximal variation. At the time, 42 countries were represented in the EURACT council. Reminders were sent to non-responders.

Identification of ECE programmes is problematic as the definition of ECE is contested (Başak et al. 2009). Through consensus discussion and utilising the work of previous surveys, we defined ECE as student contact with real patients in real clinical settings, occurring during the pre-clinical (or bachelor) years of medical school (usually years 1 and 2).

Simulations or interviewing patients on campus were not included. Elective or student-selected courses with ECE, (i.e. courses not delivered to all students at the medical school in question), were not included. If the ECE occurred during the third year of medical education, the respondent was contacted to clarify whether this was a pre-clinical year or not.

Quantitative analyses

Descriptive quantitative analyses were done using Microsoft Excel and SPSS version 27. Categorical variables were described with percentages, and continuous variables with median, interquartile range, and total range. When calculating times, 1 day was considered equivalent to 8 h.

Qualitative analyses

Two analytic approaches were used for qualitative analysis:

1. Where responses were brief, word or theme frequency was used (Robson 2002)
2. Where responses were more detailed, a thematic analysis approach was used (Robson 2002). Here, data was initially independently analysed by four researchers: AS, HK, AD, and AH. The unit of analysis was whole responses and responses were taken at face value with no pre-determined analytic framework. Data were coded manually. Emergent themes were then identified, agreed and defined involving consensus-seeking meetings on five occasions.

Ethical approval

The study was approved by Ethics Committee at the University of Wuerzburg, Germany, ref. no. 20201203-01.

Data management/data protection

No sensitive data were collected. The data were stored in Google Forms.

Results

Participants

In total, 183 medical schools from 32 countries were invited. There were 90 responses from 30 countries (Table 1). The responses were screened using our definition of ECE and clarification was sought if there was uncertainty (performed by AD). This process yielded 89 valid responses (response rate of 49%).

Among these responses 65 (73%) medical schools had an ECE programme. The remaining 24 did not but were included in qualitative analysis to better understand potential barriers to implementing ECE. There were ECE programmes in 26/30 (87%) of the responding countries.

Departmental responsibility

In 38% (25/65) of the medical schools, ECE was run solely by general practice departments, whilst in 26% (17/65) several departments were responsible (Table 2).

Table 1. Medical schools with an Early Clinical Exposure (ECE) programme per country.

Country	Number of medical schools		
	Invited	Included	With an ECE programme
Austria	5	2	1
Belgium	10	1	1
Bulgaria	6	4	1
Croatia	4	1	1
Czech Republic	9	1	0
Denmark	4	2	2
Estonia	1	1	1
Finland	5	4	4
Georgia	4	3	3
Germany	10	10	7
Greece	7	5	4
Ireland	6	5	5
Israel	5	2	2
Italy	10	6	2
Kazakhstan	5	1	1
Kosovo	1	1	0
Lithuania	2	1	1
Malta	1	1	0
Moldova	1	1	1
Montenegro	1	1	1
Netherlands	8	4	4
Norway	4	4	4
Portugal	8	4	3
Romania	7	0	0
Slovakia	3	0	0
Slovenia	2	2	2
Spain	10	6	4
Sweden	7	1	1
Switzerland	7	5	4
Turkey	10	3	1
Ukraine	10	3	0
United Kingdom	10	4	4
Total	183	89	65

In the remaining 10 countries represented on the EURACT council (Albania, Bosnia & Herzegovina, France, Hungary, Kyrgyzstan, Latvia, Macedonia, Poland, Russia, and Serbia), for various reasons, no invitations were sent.

Location

The ECE took place in both community and hospital settings in 46% (30/65) of the medical schools, only in a community setting in 42% (27/65), and only in a hospital setting in 12% (8/65) of the medical schools (Table 2). This means that primary care is involved in the delivery of 88% of ECE programmes and secondary care in 58%. The ECE ran through the first year in 69% (45/65) of the medical schools reporting an ECE programme.

Time

The median total time spent by the students on the ECE programme was 5 days (IQR 3–13, range 0.5–79), while the median time spent with patients was 3 days (IQR 1–8, range 0.2–79) (Table 3). In 57% (37/65) of the programmes, the number of clinical encounters per student during ECE was 10–50. In 88% (57/65) of the medical schools, the students spent time on preparation and/or follow-up work for the ECE, and the median time spent on these tasks was 8 h (IQR 4–24, range 1–180).

Learning objectives, teaching methods and barriers

We inquired about learning objectives and teaching methods. Most medical schools reported objectives concerning communication skills, clinical skills or simply experiencing the atmosphere in clinical settings (Table 4). Additionally,

Table 2. Responsible department, location, and study years of Early Clinical Exposure (ECE).

	n	%
Department responsible for ECE programme		
General Practice/Family Medicine/Primary Care	25	38
Internal/Clinical/General Medicine	7	11
General Practice + Internal Medicine	5	8
Faculty of Medicine	4	6
Other	7	11
Several	17	26
Location of ECE		
Primary health care only	27	42
Specialist health care only	8	12
Both primary and specialist health care	30	46
General practices	51	78
Home visits	21	32
Nursing homes	12	18
Community centres	5	8
Community pharmacy	1	2
Hospital wards	32	49
Specialist outpatient clinics	11	17
Hospital ED	2	3.1
Year(s) of ECE		
Year 1	14	22
Year 2	12	18
Year 3	6	9
Year 1 + 2	20	31
Year 1 + 3	1	2
Year 2 + 3	2	3
Years 1–3	10	15
Total	65	100

Table 3. Total time spent and number of clinical encounters in Early Clinical Exposure (ECE) programme.

	n	%
Duration		
≤1 day	7	11
>1–5 days	27	42
>5–10 days	11	17
>10–20 days	12	19
>20 days	7	11
Total ^a	64	100
Time spent with patients during ECE		
≤1 day	18	28
>1–5 days	25	39
>5–10 days	8	13
>10–20 days	7	11
>20 days	6	9
Total ^a	64	100
Number of clinical encounters		
<10	17	26
10–50	37	57
50–100	6	9
>100	5	8
Total	65	100
Time spent on preparation/follow-up-work for ECE		
≤4 h	14	33
>4–8 h	9	21
>8–20 h	17	40
>20 h	3	7
Total ^b	43	100

^aMissing data for 1 medical school.

^bMissing data for 14 of the 57 medical schools where students spend time preparing for early clinical exposure.

programmes with the highest numbers of patient encounters are aimed at developing professionalism, clinical reasoning, and a holistic approach. Participants specified the objectives using free texts.

Experiences with patients (e.g. 1:1 clinical bedside teaching) with direct instructions were often practiced by learning from senior students or junior doctors (Table 5). Speaking with team members helped students to immerse themselves in the actual work situation. In some medical schools students have the possibility to follow a patient

Table 4. Objectives of Early Clinical Exposure (ECE) programmes.

Objective (Frequency ^a)	Comments and examples
Communication skills (28)	'To understand the role of good doctor-patient communication,' 'Improving communication skills.'
Skills/procedures/clinical skills (30)	'Examination of motor system, circulation system, breathing system and abdomen,' 'basic interpretation of an ECG.'
Understanding/experiencing the care environment and its structure (26)	'Just to feel the atmosphere, keeping an open mind.'
Holistic approach/the patient perspective/the biopsychosocial model (19)	'Explain to students what family medicine is, its features, philosophy, basic concepts.'
Professional perspective (18)	'To introduce the main theories of social science and psychological development, including learning theory, attachment and systems theory.'
Clinical reasoning (<10)	'Finding role models, strengthen professional identity, learn about caring/nursing, and be a team member, professional behaviour towards patients and colleagues.'
Health promotion and prevention (<10)	'Dealing with real un-selected patients, making clinical decisions.' 'To involve students in an early clinical activity, starting from the most common clinical cases, experiencing a holistic approach to the patient and the diseases.'
Ethics in practice (<10)	'To manage prevention in clinical practice.'
Chronic illness (<10)	'To approach the young student as soon as possible to the real life in community medicine.'
Psychological aspects of disease (<10)	'To discuss the importance of a patient perspective in the consultation, to understand ethical principals in clinical work.'
	'To perform a complex history of a chronically ill patient, to experience a patient in his home setting.'
	'Identify the challenges faced by patients living with a chronic disease and their families.'
	'The person and not only to the disease: explain to students what family medicine is, its features, philosophy, basic concepts, the role of a family doctor in the life of society.'

^aSome medical schools gave more than 1.

Table 5. The teaching methods in programmes for early clinical exposure (ECE) in European medical schools in 2021.

The teaching methods in the ECE	Methods before or after the ECE
<ul style="list-style-type: none"> • Observation of consultations • Different tasks during observation: doctor patient relationship, patients' complaints, attitudes • Interviewing patients about their perspectives after the consultation • Interviewing persons at their homes to hear the life-course narrative • Shadowing nurses/older students • Helping nurses in a longer placement • Being a patient navigator • Meeting a patient with chronic conditions on several occasions during 2 years • Interviewing 3 family members during a home visit to have 3 different narratives • Completing tasks outlined in a guidebook or logbook • Visiting a patient with a nurse student 	<ul style="list-style-type: none"> • Lecture/seminar • Case-based learning • Problem-based learning • Group-based learning • Patient interview at campus • Virtual patient cases • Simulated patients • Role-play • Reflective diaries afterwards (about personal learning/experience/ doctor-patient relationship/patient with a disease/professional development) • Self-reflections with peers and/or tutors • Preparing oral presentations • Writing case-reports • Reflective small group discussions

Table 6. Barriers to implement or expand an ECE programme in medical schools. Items extracted from 36 responses of 89 participating medical schools.

Barriers (frequency)	Geographical variation in Europe
No curriculum time to spare (11)	no variation
Resistance to placements by senior figures (6)	Mainly Mediterranean
Not enough GP (6) or any (1) teaching practices attached to medical school	West, Central, South
Not enough experienced teachers for number of students (7)	East, South
Not enough money (6)	North, also South
• Hospital chosen as preferred location/cheaper (2)	
Increasing numbers of students (5)	East, also Central
Lack of administrative knowledge or other organisational barriers (4)	East
No academic unit of primary care (3)	East, South
ECE programme stopped (insurance issue) (1)	South-East

through an illness or over a longer period of time including home visits or visits in nursing homes.

According to our definitions of ECE (seeing real patients), other methods are used together or parallel with ECE. We found reflective methods in various ways: small group discussions, seminars or reflective diaries, viewing films or art, and guided reading. Many faculties reported also role-play, communication with simulated patients or

with peers, and learning in small groups. Further methods in this context were: giving presentations, working with video cases, or listening to patient stories during a lecture.

Half of the respondents (45/89) expressed some barriers to implementing or expanding ECE programmes, mostly due to a lack of time within the curriculum and the resistance of leading persons in the faculties towards innovations (Table 6).

Discussion

Summary of results and comparison to previous survey

Our survey from 30 European countries showed, that ECE was used in 73% of the responding medical schools. Compared with the previous European survey from 2006 (Başak et al. 2009), there are still fewer medical schools using ECE in Central and Eastern Europe. However, we failed to receive data from several countries in these regions. In the previous study, substantial ECE activities were found in 73% (16/22) of countries, compared to 87% (26/30) in ours. Primary care is still the main arena, 88% of the ECE placements involved primary care in both studies, while specialist health services were involved in 58% in 2021 and 48% in 2006. Home visits were increasingly used, in 32% in 2021, compared to 8% in 2006. In summary, there appears to have been little meaningful change in ECE provision over the last 15 years, either in terms of the time spent on ECE programmes or their location.

We found little geographical variation in either the outcomes or teaching methods used on ECE. Broadly applicable outcomes such as ‘developing communication skills,’ ‘developing of generalist clinical skills,’ and ‘experiencing different healthcare locations within a healthcare system’ were present in most ECE programmes. These outcomes perhaps reflect the small amount of time allocated to ECE programmes, the early stage of the learners, and their understandable lack of medical knowledge. Broadly applicable general outcomes may also be easier to apply in work-based learning placements (Harding et al. 2020).

The teaching methods employed (mostly general observation and large-group teaching) tended to reflect the general nature of the outcomes sought. It was notable that most ECE programmes (74%) encouraged reflection – either before the placement, during, or afterwards – following the ideals of experiential learning (Kolb 1984). This was particularly notable in ECE programmes, where time was very limited – perhaps in an attempt to maximise learning.

The importance of authentic clinical experience has been emphasised (Alberti 2018; Simmenroth et al. 2020) and the small amount of overall time (median 5 days), the small numbers of direct patient contacts, and the lack of any meaningful progress in the expansion of ECE programmes over the past 15 years is a cause for concern. When ECE is established, then it holds great opportunities in various areas of expertise. Combining methods and learning goals in a hierarchical way, we have chosen a modified Miller’s pyramid (Miller 1990) to illustrate a «gold standard» for ECE (Figure 1).

Barriers to implementing or expanding ECE programmes were commented on by many GP/FM-based ECE programmes and often seemed to imply negative attitudinal approaches to GP/FM, such as a lack of ability to find sufficient curriculum time or money or the lack of any department of primary care or general practice from which to co-ordinate ECE. In one prominent case, open resistance to GP/FM placements was encountered by senior figures at medical schools. Better understanding of cultural attitudes towards primary care at medical schools may therefore be a useful line of future research in order to expand ECE programmes.

In both primary and secondary care, the teaching capacity to deliver ECE is problematic, due in part to large service demands (Seabrook 2003). The advent of technology to facilitate clinical learning such as remote streaming of clinical practice and learning from banks of video-based clinical cases may be particularly relevant to junior students in ECE programmes. However, as the demand for clinical learning opportunities increases, there may be a balance to be sought between ensuring capacity and providing authenticity. Authenticity should not be replaced. Instead, longitudinal integrated tracks or students assuming roles as team members, examples of which were reported in our survey as well, raise a need for further research about their utility, benefits, and resourcing. Implementation and evaluation studies of pedagogic approaches such as these approaches are urgently needed in ECE programmes.

As discussed, the median time spent on ECE programmes is just 5 days. Out of 2 years, this appears low, and given the clear contributions that ECE appears to make to learning, expansion of these programmes would appear important.

Strengths and limitations

The response rate of 49% is acceptable for a questionnaire study and a wide variety of medical schools have been sampled. There was no overall discernable geographical pattern in whether medical schools responded or not, though Eastern Europe was over-represented among the countries where invitations were not sent. Some countries did not respond because they do not have ECE programmes and this may mean that our results overestimate the proportion of European medical schools that have ECE programmes. It would be interesting to know how ECE programmes are undertaken in other parts of the world and a worldwide survey, for example, promoted by WONCA, would be helpful.

The questionnaire was developed from a previous study, piloted, and subsequently refined. However, some respondents seem to have perceived we were asking for ECE in primary care, not ECE in general. Hence, some ECE programmes may not have been fully reported. Furthermore, the questionnaire was sent out 1 year into the Covid-19 pandemic, and some respondents seemed to respond as if we inquired about ECE during the pandemic.

Conclusion

Our survey does not suggest a significant change in the emphasis of ECE programmes, compared to the previous survey. There has been little expansion of ECE programmes in some countries and medical schools over 15 years, despite of their positive impact. More work is required to address and overcome attitudinal barriers in order to increase the provision of ECE primarily in settings outside of (university) hospitals. Experimentation with new teaching methods that appropriately match the needs of early-year students to the service and educational demands placed upon clinicians, appears paramount. However, increasing teaching capacity may risk losing authenticity.

Progress in medical education is slow and in clinical education, it can be glacial. Given our current

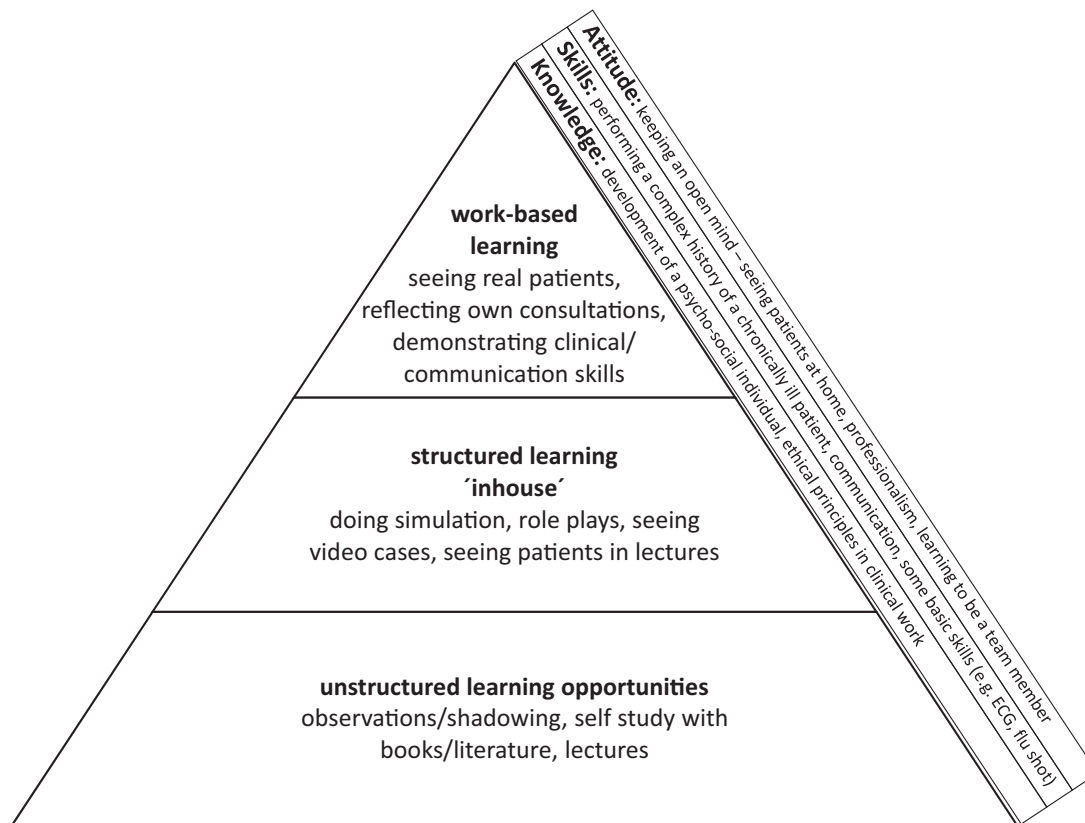


Figure 1. Methods and aimed learning goals in Early Clinical Exposure (ECE) programmes in European medical schools, implemented in modified Miller's pyramid (Miller 1990).

environmental predicament and the increasing demand for clinical experience, the key questions raised in this study appear (paradoxically); how can we stop global (educational) cooling and encourage a little more warmth in clinical education attitudes and innovation?

Acknowledgements

The authors thank the EURACT-council members for sending the questionnaire to their countries and the colleagues at the medical schools for their careful processing of the questionnaire.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The author(s) reported there is no funding associated with the work featured in this article.

Glossary

Early clinical experience (ECE): Involves placing healthcare students in their early years in authentic clinical environments. Also, short ECE has an impact on general integrative outcomes such as communication skills, clinical reasoning, experiencing the breadth of healthcare environments, and patient-centeredness. As such, community and generalist settings are often used. ECE is resource intensive and so reflection before and after the experiences frequently takes place.

Notes on contributors

Anne Simmenroth, PhD, MD, Head of Department, senior teacher, Department of Family Medicine, Faculty of Medicine, Würzburg, Germany.

Alex Harding, PhD, MD, Sub Dean, Course Director Medical clinical Education, Department of Primary Care, University of Exeter College of Medicine and Health, Exeter, UK.

Odd Martin Vallernes, MD, Acute Medicine research group, senior teacher, Department of General Practice, University of Oslo, Oslo, Norway.

Aimee Dowek, MD, medical student, Royal Hampshire County Hospital, Winchester, Hampshire, UK.

Francesco Carelli, MD, Senior teacher, Department of Clinical Medicine, Faculty of Medicine, Milan, Italy.

Nino Kiknadze, MD, Director of Clinical Service, senior teacher, Department of Family Medicine, Faculty of Medicine, Tbilisi State Medical University, Tbilisi, Georgia.

Helena Karppinen, PhD, MD, Clinical instructor, Supervisor for doctoral programme, Department of General Practice and Primary Health Care, University of Helsinki, Helsinki, Finland.

ORCID

Anne Simmenroth  <http://orcid.org/0000-0002-3521-1225>
 Odd Martin Vallernes  <http://orcid.org/0000-0003-1213-392X>
 Helena Karppinen  <http://orcid.org/0000-0002-4325-484X>

References

Alberti H. 2018. Authentic general practice placements for medical students. *Educ Prim Care*. 29(4):244–245.

- Alberti H, Randles HL, Harding A, McKinley RK. 2017. Exposure of undergraduates to authentic GP teaching and subsequent entry to GP training: a quantitative study of UK medical schools. *Br J Gen Pract.* 67(657):e248–e252.
- Başak O, Yaphe J, Spiegel W, Wilm S, Carelli F, Metsemakers JF. 2009. Early clinical exposure in medical curricula across Europe: an overview. *Eur J Gen Pract.* 15(1):4–10.
- Diemers AD, Dolmans DH, Verwijnen MG, Heineman E, Scherpbier AJ. 2008. Students' opinions about the effects of preclinical patient contacts on their learning. *Adv Health Sci Educ Theory Pract.* 13(5): 633–647.
- Dornan T, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V. 2006. How can experience in clinical and community settings contribute to early medical education? A BEME systematic review. *Med Teach.* 28(1):3–18.
- Dost S, Hossain A, Shehab M, Abdelwahed A, Al-Nusair L. 2020. Perceptions of medical students towards online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students. *BMJ Open.* 10(11):e042378.
- Gilchrist VJ. 1992. Key informant interviews. In: Crabtree BF, Miller WL, editors. *Doing qualitative research.* Thousand Oaks (CA): Sage Publications; p. 70–89.
- Golden BP, Henschen BL, Gard LA, Ryan ER, Evans DB, Bierman J, Cameron KA. 2018. Learning to be a doctor: medical students' perception of their roles in longitudinal outpatient clerkships. *Patient Educ Couns.* 101(11):2018–2024.
- Harding A, Rosenthal J, Hawthorne K. 2020. *Learning general practice: an online textbook for learners and teachers.* London (UK): RCGP/SAPC.
- Kolb DA. 1984. *Experiential learning: experience as the source of learning and development.* Englewood Cliffs (NJ): Prentice Hall.
- Littlewood S, Ypinazar V, Margolis SA, Scherpbier A, Spencer J, Dornan T. 2005. Early practical experience and the social responsiveness of clinical education: systematic review. *BMJ.* 331(7513):387–391.
- Miettola J, Mantyselka P, Vaskilampi T. 2005. Doctor-patient interaction in Finnish primary health care as perceived by first year medical students. *BMC Med Educ.* 5:34.
- Miller GE. 1990. The assessment of clinical skills/competence/performance. *Acad Med.* 65(9):S63–S67.
- Oppenheim AN. 1992. *Questionnaire design, interviewing and attitude measurement.* London (UK): Continuum.
- Pei L, Wu H. 2019. Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Med Educ Online.* 24(1):1666538.
- Pfarrwaller E, Sommer J, Chung C, Maisonneuve H, Nendaz M, Junod Perron N, Haller DM. 2015. Impact of interventions to increase the proportion of medical students choosing a primary care career: a systematic review. *J Gen Intern Med.* 30(9):1349–1358.
- Rees EL, Quinn PJ, Davies B, Fotheringham V. 2016. How does peer teaching compare to faculty teaching? A systematic review and meta-analysis. *Med Teach.* 38(8):829–837.
- Robson C. 2002. *Real world research.* 2 ed. Oxford (UK): Blackwell Publishing.
- Sathishkumar S, Thomas N, Tharion E, Neelakantan N, Vyas R. 2007. Attitude of medical students towards early clinical exposure in learning endocrine physiology. *BMC Med Educ.* 7:30.
- Seabrook MA. 2003. Medical teachers' concerns about the clinical teaching context. *Med Educ.* 37(3):213–222.
- Simmenroth A, Carelli F, Vallersnes OM, Sammut MR, Zarbailov N, Cojić M, Kiknadze N, Rieder A, Madjova V, Harding A, et al. 2020. European education requirements for the undergraduate general practice/family medicine curriculum. EURACT Consensus Paper. EURACT. [accessed 2022 Mar 23]. <https://euract.woncaeurope.org/sites/euractdev/files/documents/publications/others/bmeeducation-requirements-151220finalwith-we.pdf>.
- Tayade MC, Latti RG. 2021. Effectiveness of early clinical exposure in medical education: settings and scientific theories - review. *J Educ Health Promot.* 10:117.
- Vallee A, Blacher J, Cariou A, Sorbets E. 2020. Blended learning compared to traditional learning in medical education: systematic review and meta-analysis. *J Med Internet Res.* 22(8):e16504.
- Yardley S, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V, Dornan T. 2010. What has changed in the evidence for early experience? Update of a BEME systematic review. *Med Teach.* 32(9): 740–746.