Non-Traditional Teaching Methods in Undergraduate Dermatology Training: A Scoping Review

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**Categories:** Comparative Medical Education, Educational Strategies, Students/Trainees, Teaching and Learning, Undergraduate/Graduate

**Received:** 27/11/2020  
**Published:** 09/06/2021

**Abstract**

**Background and Objectives:** Dermatology teaching is underrepresented within the undergraduate curricula and adequate teaching is becoming more challenging with current pressures on service delivery. Undergraduate dermatology is taught through a mixture of traditional methods including formal lectures, tutorials and attendance to outpatient clinics. Studies have shown use of traditional methods alone cannot be relied on. The aim of this research is to evaluate the evidence on the use of non-traditional teaching methods in undergraduate dermatology training.

**Methods:** A scoping review methodology was utilized. The literature search was performed in electronic databases PubMed, Ovid Medline and EMBASE. Articles were selected against an inclusion and exclusion criteria.

**Results:** The search identified 725 records of which 23 met the inclusion criteria. The most common teaching methods used across the selected studies was computer aided learning, followed by moulage simulation, competitive based learning, precision teaching and use of cinematic films. Effectiveness of teaching methods used were tested through means of knowledge acquisition tests, student perception questionnaires or both. There was a mixture of quantitative and qualitative data. Knowledge acquisition tests generally showed that newer teaching methods were just as effective as the traditional approaches. Student feedback was overall very positive.

**Conclusion:** The evidence suggests the use of non-traditional teaching methods in undergraduate dermatology, but the evidence of their effectiveness is limited and more rigorous studies are required in future research. Use of non-traditional educational methods are unlikely to fully replace the vital patient contact observed with more traditional methods; it would be best used alongside the more traditional approaches to create an overall enhanced learning environment.

**Keywords:** Medical Education; Undergraduate; Dermatology, Novel teaching methods
Introduction

Dermatology as a subject is underrepresented within the undergraduate medical curriculum despite the prevalence of skin disease (Yaakub et al., 2017). In the current medical practice, physicians regularly encounter dermatological issues, and around 25% of GP consultations are skin-related (Schofield et al., 2011). Lack of dedicated dermatology teaching is reflected through low confidence in recognition and diagnosis of skin conditions. Therefore, adequate dermatology training at an undergraduate level is crucial so that future physicians can confidently diagnose and manage skin conditions.

In the UK, the British Association of Dermatologists (BAD) have published a curriculum to support the departments responsible for dermatology teaching at UK universities. This was initially set out in 2006 (Clayton, Perera and Burge, 2006) and revised in 2016 (Cohen et al., 2016). An audit was carried out to evaluate dermatological content in UK undergraduate curricula in 30 medical schools and results showed dermatology teaching varied widely across the UK (Yaakub et al., 2017). Of particular note, dermatology teaching was not compulsory in all medical schools with around 75% of schools dedicated time to dermatology teaching.

Across the world, there is a common theme of lack of undergraduate dermatology training. In Ireland, newly qualified doctors at Irish university hospitals displayed low satisfaction levels with their undergraduate dermatology experience (Kelly, Hennessy and Ryan, 2018). Similarly, in Canada, multiple surveys shown similar problems with only 3 medical schools have dermatology as a mandatory module (Hu and Vender, 2018). Within Australian medical schools, the same issues were highlighted including limited exposure to dermatology teaching and dermatology clinical teaching was compulsory within only 4 schools (Gupta et al., 2017). Students perceptions of dermatology teaching within four Californian medical schools were generally positive but "hands-on experience" was felt to be lacking (Davari et al., 2017).

Dermatology, at an undergraduate level, is taught through a mixture of methods that can be classified as "traditional". Lectures, the most common traditional teaching method (across most undergraduate teaching), is useful for delivering information to a large group of students, but requires an effective lecturer and assumes all students are learning at the same pace (Kandiah, 2017). Other traditional teaching methods include attendance to outpatient clinics, the most common method of dermatology undergraduate learning (Chiang et al., 2011), small group tutorials and bedside teaching.

The main challenges within the dermatology speciality are delivering adequate teaching to students with a limited number of clinicians and an increasing workload (Pardoe et al., 2020). Since the development of new treatments, dermatology inpatient admissions have radically declined. Inpatient numbers have also reduced as a result of a transition from fixed dermatology wards to a more multidisciplinary outpatient care approach (Levell et al., 2013). This takes away the valuable opportunity to examine and learn from dermatology inpatients. Small-group tutorials have been rated the "least effective" teaching method in one study focused on a group of dermatology students (Eisen et al., 2015). Furthermore, despite outpatient clinics exposing students to a variety of different skin conditions, teaching depends on the opportunities presented at each clinic as conditions may vary. Additionally, dermatologists may find time for teaching challenging with the current pressures of service delivery. Overall, studies have shown that the use of traditional methods alone cannot be relied on for delivering the necessary skills for diagnosis and management with undergraduates (Remmen et al., 1999).

There is an emerging use of innovative teaching methods within dermatology undergraduate curricula, including the use of electronic and online virtual learning methods (Hu and Vender, 2018). Developing new approaches in dermatology teaching not only will aid in maximizing the learning opportunities of the student’s short dermatological
placements, but it can also help decrease the pressure teaching on dermatology educators in this current NHS climate. This study aims to explore the evidence for use of non-traditional teaching methods within undergraduate dermatology. A scoping review methodology was used for this research, which encompasses a further type of literature review. Scoping reviews are useful in identifying gaps in the evidence and addressing an exploratory research question that has not previously been well researched (Colquhoun et al., 2014).

Methods

The scoping review is guided by the framework proposed by Arksey and O'Malley (Arksey and O'Malley, 2005), which was then further developed by Levac et al. (Levac, Colquhoun and O'Brien, 2010), Coquhoun et al. (Colquhoun et al., 2014) and Joahnna Briggs institute (Peters et al., 2015). The review process was carried out in 4 stages, as follows:

Stage 1: Identifying the research question

The primary research question developed as the focus of the study was "What non-traditional teaching methods are being used in the teaching of undergraduate dermatology and how effective are the use of these non-traditional teaching methods in the context of dermatology at an undergraduate level"?

The primary objective is to identify non-traditional methods used in undergraduate teaching and examine how effective these methods are in dermatology training. The secondary objective of the study was to identify how the effectiveness of said teaching method were evaluated.

Stage 2: Identifying the relevant studies

The following electronic databases were used to search for relevant literature: PubMed, Ovid MEDLINE and EMBASE. The following search strategy was used: "Dermatology OR Skin Disease" AND "Medical Education OR Undergraduate OR Medical Student" AND "Novel Teaching Methods OR Non-traditional Teaching Methods OR Modern Teaching Methods OR E-learning OR Online OR Teledermatology OR Simulation OR Moulage OR 3-dimensional OR Virtual Reality OR Integration". To supplement the search, reference lists were also screened for relevant studies. Articles were then exported to reference manager Mendeley and duplications were excluded.

Stage 3: Study selection

Articles were included; if they were full-text articles that focused on the teaching of dermatology at an undergraduate level only using methods that were thought to be non-traditional/novel/innovate/modern and published after the year 2000. There were no language restrictions.

Articles were excluded if they included postgraduate trainees, other allied health professionals and those that involved patient education. Conference abstracts, letters, editorials, commentaries were also excluded. Studies were screened for eligibility by two independent assessors, and disagreement was resolved with discussion.

Stage 4: Charting the data

A data charting form was drafted and piloted in 10 studies. Subheadings were finalised after this piloting exercise to include: author, year of publication, country of origin, study design, population (number of medical students and year of study), the teaching method used and outcome. The relevant data was then extracted from each of the included articles.

Stage 5: Collating, summarising and reporting the results
Microsoft Excel was used for completion of basic numerical analysis and results are presented in graphs and tables.

**Results**

Electronic databases generated 724 articles with one article hand sourced, giving a total of 725 articles. After duplications were removed, 582 articles remained, of which 59 articles were eligible after screening the titles and abstracts against the inclusion and exclusion criteria. After full-text review, a further 36 articles were excluded. The remaining 23 articles were deemed eligible and included in data analysis (Figure 1).

**Figure 1:** PRISMA 2009 Flow Diagram
Adapted version of original figure published by Moher et al. in 2009.

Characteristics of included studies

The study characteristics are summarised in the data charting table (Table 1). In terms of country of origin, 9 articles emerged from the United States of America, 4 from the United Kingdom, 2 from India and 2 from Brazil, 1 each from the following; Australia, Canada, Germany, Netherlands, Pakistan and Saudi Arabia. Further analysis has
demonstrated that 18 publications arose from developed countries, and 5 from developing nations.

Year of study ranged from 2002 to 2019 and there has been an increase in research in this area since 2010, with an average of 2 studies per year being selected for this scoping review.

The study design included eight studies randomised control trials, thirteen were non randomised single-arm studies and two were qualitative studies.

The number of medical students that participated ranged from 16 to 541. 2969 medical students in total participated across all studies. The average number of students per study was 141. Most of the studies had participants from 3rd and 4th-year medical students (5 studies each), followed by 2nd-year medical students. 1st and 5th-year medical students were represented in 2 studies each.

Table 1: Data charting table

| Author                      | Year of publication | Country of origin | Study design                        | Population | Teaching method tested | Outcome                                                                 |
|-----------------------------|---------------------|-------------------|-------------------------------------|------------|------------------------|-------------------------------------------------------------------------|
| Dunnick, C. A., et al.      | 2019                | USA               | Single arm non-randomised study     | 184 1st year medical students | Use of 3-Dimensional models of various skin lesions | Student feedback was collected; 94.8% were satisfied or very satisfied with the use of tactile learning tool |
| McGuckian, J., et al.       | 2019                | UK                | Single arm non-randomised study     | 163 3rd year medical students | Escape room                           | Student feedback was strongly positive, 100% ”strongly agree” on enjoying the session. |
| Yang, C. Y., et al.         | 2018                | USA               | Single arm non-randomised study     | 541 1st year medical students | Integration (with other modules)            | Students feedback was positive and felt it help with better understanding of dermatology |
| Fransen, F., et al.         | 2018                | Netherlands       | Randomised control trial            | 84 4th year medical students | Education in Dermatology-an E-learning programme (application on smartphone) | Positive outcomes on student learning, with a statistically significant difference in post intervention tests between control and e-learning group. Positive student feedback. |
| McGrath, C., et al.         | 2018                | UK                | Randomised control trial            | 134 3rd year medical students | Precision Teaching - "Say All Fast Minute Each Day Shuffle" (SAFMEDS) | A statistically significant improvement was noted in the intervention groups’ post-test. Participants experiences were also positive. |
| Sabzwari, S., et al.        | 2017                | Pakistan          | Single arm non-randomised study     | 96 3rd year medical students | Moulage simulation                     | The dermatology stations were performed better than the other stations in the OSCE. Medical students were able to identify the artificially created dermatological lesion well. |
| Kunzler, E., et al.         | 2016                | USA               | Single arm non-randomised study     | 143 2nd year medical students | Competition based learning through online quizzes | Over 50% student participation with positive experiences exhibited. |
| Kaliyadan, F., et al.       | 2014                | Saudi Arabia      | Single arm non-randomised study     | 129 5th year medical students | Computer based OSCE                    | Student feedback questionnaire were positive |
| Soiremann, M., et al.       | 2013                | Brazil            | Randomised control trial            | 55 3rd year medical students | Computer aided learning programme      | There was no statistically significant difference in post test scores in both groups. Positive student feedback was also noted. |
| Gormley, G., et al.         | 2013                | UK                | Single arm non-randomised study     | 123 4th year medical students | Temporary transfer tattoos             | A questionnaire to evaluate candidates, examiners and SPs opinions were all positive, with high scores for “realism” |
| Hernandez, C., et al.       | 2013                | USA               | Single arm non-randomised study     | 190 4th year medical students | Moulage                               | This assessment was part of an OSCE framework; checklist included history taking, physical examination findings, differential diagnosis and workup. |
| Cipriano, S. D., et al.     | 2013                | USA               | Single arm non-randomised study     | 51 4th year medical students | Online modules                        | All students had improved post intervention test scores in comparison to pre-test. Student experiences were positive. |
| Wagner, R. F.               | 2012                | USA               | Qualitative study                   | 3rd and 4th year medical students | Film                                  | A popular class at the university with some documented positive experiences from students. |
| Grover, C., et al.          | 2012                | India             | Single arm non-randomised study     | 71 6th semester students | Computer based assessment             | Positive participant feedback, with >90% finding it challenging and stimulating. |
| Singh, D., et al.           | 2011                | Australia         | Randomised control trial            | 142 final year medical students | Online modules                        | Knowledge and skills gained, as well as confidence in management, were scored higher in the intervention group. |
| Study | Year | Country | Study Design | Group Details | Intervention | Outcomes |
|-------|------|---------|--------------|---------------|--------------|----------|
| Silva, C. S., et al. | 2011 | Brazil | Randomised control trial | 44 2nd year medical students | E-learning programme | Students in the intervention group scored significantly higher in post-tests than control group. |
| Dolev, J. C., et al. | 2011 | USA | Randomised control trial | 252 3rd and 4th medical students | Internet based programme-containing tutorials aimed at teaching skin cancers | The online group scored higher in post intervention tests, as well as having better melanoma detection rates. |
| Aldridge, R. B., et al. | 2010 | UK | Qualitative study | Medical students | 3D Virtual Reality | Documentation of positive student experience. |
| Kaliyadan, F., et al. | 2010 | India | Single arm non-randomised study | 48 3rd year medical students | Digital module | Post intervention test with 2 sections; one testing topics covered by digital module and the other covered topics taught through conventional methods. There was no statistically significant difference between test scores. |
| Garg, A., et al. | 2010 | USA | Randomised control trial | 90 2nd year medical students | 3D models | Significantly higher mean scores in intervention group. |
| Nast, A., et al. | 2009 | Germany | Single arm non-randomised study | 325 medical students (year not indicated) | Online lectures | Student's feedback was generally positive and welcomed the use of online lectures. |
| Jenkins, S., et al. | 2008 | USA | Randomised control trial | 73 2nd year medical students | Computer assisted online module | Post intervention test scores were higher in the online module group. |
| Hong, C., et al. | 2002 | Canada | Single arm non-randomised study | 178 "senior" medical students | Online interactive examination model | 93% of students found this method useful and effective, as well as supporting further use. |

**Types of teaching methods**

Different types of teaching methods were initially identified from the studies included in this review. There was, however, an apparent overlap between the methods used and therefore six themes as follows: computer-aided learning (13 studies), moulage simulation (five studies), competitive based learning (two studies), integration (with other modules -one study), precision teaching (one study) and use of film/cinema (one study) (Figure 2). As can be observed, computer-aided learning is the most common novel method found.

**Figure 2: Types of teaching methods**

![Types of teaching methods](image)

**Effectiveness of non-traditional teaching methods used in dermatology training**
Of the included studies, twenty-one evaluated the effectiveness of the non-traditional teaching methods using different study designs. Eight studies were randomised control trials; in which students were randomised into a control group (the majority of which continued with traditional teaching) and the other as the intervention group (new teaching intervention). Thirteen were non randomised studies in which a single group of students were exposed to the intervention (no control group). The studies generally measured effectiveness in two domains; knowledge acquisition and student perceptions, with some studies measuring both and in some, only one domain was reported:

**Knowledge Acquisition Tests:** Nine studies in total used tests to assess knowledge acquisition with the new teaching intervention. Six studies showed that there was a statistically significant difference in test scores within the student population; suggesting that there was an effect on knowledge acquisition with the new teaching intervention. Three of the studies showed that there was no statistically significant difference in test scores; suggesting that the new intervention is just as effective as traditional teaching methods.

**Student Perceptions:** Fifteen studies in total assessed students’ perception of the new teaching methods and presented the data quantitatively. All studies showed that the new teaching methods were taken up well by students and were consistently rated very highly amongst the questionaries’ results.

The questions asked varied slightly from study to study, but covered these following areas; 1. satisfaction with new teaching intervention, 2. confidence with dermatological conditions and its description, 3. better understanding and learning of dermatology, 4. realism, 5. preference over other teaching methods, 6. use in the teaching of other specialities.

Three, of fifteen, studies have gathered qualitative data regarding student perception – these were collected through means of questionnaires, interviews and focus groups. The emergent themes of student perception all appeared to be very promising and positive. Examples of these themes include: "accessibility", more "awareness of dermatology" as a speciality, "impact of the programme on learning approaches", "drilling the message home" and "enhanced confidence".

**Discussion**

The most common type of non-traditional teaching methods found within the literature search was computer-aided learning. This ranged from e-learning programmes that were accessible via a computer or a smartphone to three-dimensional virtual reality. The main advantages of using the computer-aided learning approach are that it works well with the visual aspect of the dermatology specialty. The computer programmes, as discussed within the literature, provided various clear images of different types of skin lesions; some even allowed this to happen in more depth. They are easily accessible and relatively easy to use. Technology has already become a part of medical education, so making these computer programmes easily available through the use of personal devices such as smartphones is a useful learning aid, particularly during the short time dedicated to dermatology teaching. It allows for a self-directed learning approach amongst medical students, which may lead to better knowledge retention. It also offers the opportunity to learn about other skin conditions that are important to know about but may not necessarily see at outpatient clinics or within dermatology inpatients. Computer-aided learning can be easily applicable in today’s technological advancement, with universities usually having IT facilities available for its students. However, most of the evidence on the efficacy of these methods is obtained through students’ perspectives and a lot needs to be learned if they are more efficient than traditional methods in knowledge and skills acquisition. One article has noted that computers do not "replace the instructor", suggesting the importance of student and facilitator interaction in learning.

Computer-aided learning was the most researched teaching method and many of the studies in this area and included in this review adopted appropriate methodology and research design. The evidence, therefore, obtained from these
studies is high. It is worth mentioning however that many of the included studies were single arm non-randomised studies and therefore care should be taken in interpretation and application of their findings into practice.

The second most common non-traditional approach identified from the literature was moulage simulation. This is the use of artificial material to simulate particular skin lesion/conditions. Moulage allows the student to get a “real feel” of particular skin lesions; it allows them to learn about these lesions as if it was a real case, how they present on an individual and how they look and feel on skin examination. The studies that tested moulage as a novel teaching method included the use of 3D prosthetics or “tattoos” that were affixed to simulated patients. This novel method works well, once again, with a visual aspect of the speciality. This is useful for many reasons, including in teaching how to describe rashes/lesions and for assessment purposes where a prosthetic can be applied to a simulated patient e.g. in an OSCE. Potential limitations of moulage, however, include how easily these lesions can be made and the costs of manufacturing. Flatter lesions are likely to be easier to produce and cheaper in comparison to more 3D lesions; these are likely to be a limiting factor for medical schools in developing countries where the resources are limited. In addition, the use of these lesions in a teaching environment will require a facilitator to be present, and it may not be a useful aid for the student for independent learning.

Although it has many advantages, moulage was not well utilised and studied as computer-based approaches, therefore, more research is required to produce more reliable evidence to guide its use and applicability in future dermatology teaching.

The third most common method noted was competitive-based learning. One study looked at the effect of weekly quiz questions over social media and whether creating a competitive environment can increase student participation (Kunzler, Graham and Mostow, 2016). Small prizes were disrupted to the quickest correct answers. This is a relatively fun and easy way to test dermatology knowledge, and the use of social media is a good way to capture the student’s attention. An account was set up by the dermatology department at that university, which is a simple process and thus can be replicated in other medical schools. One note to make, however, there may be students who do not use or has no access to social media. The other study looked at the use of an escape room game to increase confidence in dermatology in a group of medical students. This unusual method featured teams of students taking on several tasks including “terminology quiz, topical treatment prescribing and basic literature review”. Although this is an entertaining way of teaching, as well as a team-building exercise, it is hard to imagine that this is a reproducible method of teaching dermatology to undergraduates. The limiting factors would include resources required and more research would be required in this area. Overall, the evidence is weak and more work will be needed in the future to validate its use.

Integration of dermatology teaching with other modules in the undergraduate curricula was also identified as a theme but only one study was found that report on this approach. It looked at introducing dermatology teaching in cadaveric anatomy sessions within a cohort of first-year medical students. This method is a simple and opportunistic way of introducing new medical students into basic concepts of dermatology, as well as increasing awareness and confidence early in a student’s undergraduate career. It is easily applicable; however, different types of skin lesions may be present within cadavers (if any is present at all), impacting on students’ exposure. In addition, anatomy demonstrators may require sound dermatological background knowledge to carry out this type of teaching. As for competitive learning, the lack of studies in this area will make it difficult to draw any conclusions on their use.

Precision teaching, as discussed in one study, is an education method that develops accuracy and speed in performing a skill and is thought to lead to retention amongst other learning effects (McGrath et al., 2018). Within the study that assessed this method, medical students (in an interventional group) were given a pack of flashcards, with pictures depicting various skin lesion, and given one minute to answer the question provided on the flashcard. They were advised to use this twice a day over the 5-day dermatology placement period, with a written test to assess knowledge acquisition (and compared to the control group). This is another method that utilises basic resources to
aid dermatology learning. Producing the flashcards can be relatively easy and cheap, and using this method can be done independently (as answers are provided in the back of flashcard). Once again, the use of pictures fits well with the visual aspect of this speciality. However, similar lesions can vary slightly from one person to the next, therefore the use of several pictures (of one diagnosis) will help provide adequate exposure.

This study was a randomised controlled trial that carried out knowledge acquisition tests as well as evaluating student perception. Although a strong research design was implemented and knowledge acquisition tests scores were improved in the intervention group, studies using this teaching method will need to be replicated again to draw up more reliable evidence.

Finally, the use of cinematics- as a novel dermatological teaching method- have also been documented from the literature. The article discusses the use of a class where films portraying characters with skin conditions are evaluated. This is an interesting teaching method, and likely to be more useful in evaluating the impact of skin diseases on patients, families and society as a whole. It may prompt independent learning; students may go on to research the skin conditions discussed. The paper did not produce any data to show the effectivities of this approach to teaching.

Strength and weakness of the review

To our knowledge, this is the first scoping review exploring the use of novel teaching methods in undergraduate dermatology. The review included an adequate number of studies, of varying design, involving various levels within undergraduate training and exploring a range of novel teaching methods. However, many of the studies included in the review were of low methodological quality. Most were carried out in single institutions and usually composed of a relatively small cohort. Therefore, the evidence from these studies need to be reviewed carefully before any application, of the findings, are made in practice. More studies testing the use of these teaching methods will need to be carried out to produce applicable results.

Conclusion

Computer-aided learning was the most common non-traditional teaching approach found and is already widely used in current teaching. The use of computers has had a massive impact on medical education, which goes hand in hand with the important role these technologies have in today's society.

Research on the use of non-traditional methods of teaching dermatology to undergraduate students is emerging, with studies conducted mainly over the last ten years. Although these methods have the potential to contribute to efficient dermatology training, it is unlikely to replace the traditional methods already being implemented. They would be best used alongside more traditional approaches to create an overall enhanced learning environment, particularly for dermatology as for the majority of students, their undergraduate training maybe their only form of dermatology experience.

Recommendations

Although this review from this finding showed useful information regarding the use of non-traditional teaching methods in undergraduate dermatology, it also highlighted the gaps and shortcomings of research in this area that need to addressed in future studies.

- Studies should not concentrate in student perception but rather on assessing the knowledge gain.
- Under researched methods, such as moulage, where they are likely to be more applicable to dermatology given its visual nature, should be the focus of more future research.
Attention should be given to study designs, with studies using randomised control trails as the gold standard. Future studies should also consider the costs and resources required to implement such technologies.

Take Home Messages

1. Dermatology teaching is underrepresented in undergraduate medical curricula
2. Traditional teaching methods alone do not fully provide medical students with the necessary skills, and use of other non-traditional methods is becoming an area of interest
3. Within the literature, computer aided learning is the most common non-traditional teaching method used in undergraduate dermatology teaching
4. Research on the use of non-traditional methods of teaching dermatology to undergraduate students is lacking, and more rigorous studies are required to produce applicable results
5. Novel teaching methods would be used best alongside more traditional methods to create an overall enhanced environment

Notes On Contributors

Shahd Elamin is currently a dermatology trainee within the Belfast Trust, Northern Ireland. She is interested in medical education, particularly at an undergraduate level. This study was completed as part of her dissertation for a Masters in Clinical Education at Queen's University Belfast.

Mairead Boohan is a lecturer in medical education with the school of medicine, dentistry and biomedical sciences at Queen’s University Belfast. Her research interests include assessment and student engagement with the teaching and learning process.

Acknowledgements

This scoping review was performed by Dr Shahd Elamin as part of her dissertation for a Masters in Clinical Education at Queen's University Belfast. The dissertation was submitted in January 2020 and the author was awarded the degree of Master of Science in Clinical Education with Distinction on the 8th of July 2020.

The results of this work was also presented, as a poster presentation, at the British Association of Dermatologists 100th Annual (virtual) Meeting in September 2020. The abstract for the poster presentation, titled "The use of nontraditional teaching methods in undergraduate dermatology training", was published at a special edition of the British Journal of Dermatology (Special Issue: Abstracts for the British Association of Dermatologists 100th Annual Meeting, Virtual Meeting) and can be found at: https://onlinelibrary.wiley.com/doi/full/10.1111/bjd.19097

Source of images:

Figure 1. Source: this PRISMA flow diagram is an adapted version of original figure published by Moher et al. in 2009.

Figure 2. Source: the author.

Table 1. Source: the author.

The authors would also like to thank Richard Falls, librarian at Queen’s University Belfast for assisting with literature search.
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**Appendices**

None.

**Declarations**

*The author has declared that there are no conflicts of interest.*

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**Ethics Statement**

This research did not require Ethics Board approval because it does not involve human or animal subjects.

**External Funding**

This article has not had any External Funding

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