The role of electronic case-based learning in medical education : A review of the literature

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Background

The appearance of the unprecedented Coronavirus Disease 2019 pandemic (COVID-19) has created a sudden and noticeable shift towards the exclusive usage of online learning environment as the main source of medical education (Dost et al., 2020). Delivering Case Based Learning (CBL) virtually to medical students is a new exciting educational prospect. Although there is a plethora of literature on CBL within medical education, there is a paucity of literature within the contexts of electronic CBL(e-CBL), where the literature seems to be scant and unfocused

Method

177 results retrieved from OVID Medline and British Education Index using all 3 search keywords (or alternatives) combined (Table 1.)

Inclusion criteria of papers 2016-2021 and English Language only

98 articles identified for more detailed evaluation

Excluded: Articles that focused on problem-based learning, those that did not include all 3 keywords or which were deemed overall irrelevant

20 final papers were selected for the literature review

Scan to read the full list of papers used and their references

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Aims

The aim of this literature review is to evaluate the role and significance of e-CBL within 21st century medical education

1) Illustrate the role e-CBL from a medical education perspective

2) Draw comparisons with the available literature relating e-CBL with other types of teaching

3) Analyze the benefits and limitations of e-CBL

Table 1. Key words used and their acronyms

Key word 1		Key word 2		Key word 3 3
''case-based'' OR ''case based'' OR ''case based learning'' OR ''case-based learning''	AND	''online'' OR ''digital'' OR ''remote'' OR ''virtual'' OR ''e-learning'' OR ''distance education'' OR ''computer based''	AND	''medical education'' OR ''medicine'' OR medical students OR ''MBBS'' OR ''BMBS'' OR ''MBBCh '' OR ''MBBChir'' OR ''BMBCh''

Results

Improving test scores

Recently published papers Elsayes *et al.* (2021), Cook *et. al* (2021) and Grover *et. al* (2020), assessed the effectiveness of delivering e-CBL to medical students using ''pre-session'' and ''post-session'' multiple-choice questions (MCQ) to evaluate for an increase in students' knowledge. All three papers gathered data in a similar method (MCQs) and found a marked improvement of the test scores of medical students after delivering e-CBL sessions.

Beyond MCQ scores

Zottmann et al. (2021)	Found that using e-CBL can improve medical students' clinical reasoning skills
Phillips et al. (2021) and Ali et al. (2018)	These papers found that e- CBL can serve as a way of improving clinical skills confidence
Gaupp et. al (2016)	Demonstrated the benefits of e-CBL in improving patient safety with statistically significant results
Costich et al. (2021)	Found that e-CBL can help increase the self-reported improvements by final year students related to writing paediatric admission referrals

Comparison with face-to-face CBL

There is still considerable uncertainty with how e-CBL compares to an- in person approach due to the lack of literature that discusses this. The majority of the papers which evaluate e-CBL also fail to attempt to directly compare it with a face-to face teaching.

Cook *et al.* (2021)	Schlupeck *et al.* (2021)	Holland and Pawlikowska (2019)'
Increase in knowledge did not differ between the in-person and the e-CBL group	Electronic CBL can be superior to traditional lectures	Students prefer e-CBL over face-to-face discussions

Conclusions

- The delivery of e-CBL to medical students has generally shown to be effective way of facilitating learning, improving learning outcomes and increasing knowledge of medical students across different specialities. This is encouraging in light of COVID-19 pandemic.
- Other key themes discussed in the literature review centred on the advantages and disadvantages of e-CBL and how it compares with other types of learning.
- Comparison between e-CBL and face-to-face CBL still remains unclear and requires further experimental research.
- Further research is necessary to assess the long-term benefits of using e-CBL

References

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