A Review of Methods of Developing Resilience in Undergraduate, Postgraduate and Continuing Medical Education

BEME PROTOCOL 2015

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BACKGROUND

Resilience is emerging as an important phenomenon in medical education.\(^1\) The importance of developing resilience in the wellbeing of students has been reported worldwide.\(^1\)-\(^2\) Tempski et al emphasised that resilience is an important construct which should be explored in more detail in medical education practice and research.\(^2\)

There are many descriptions of resilience within the psychological and sociological literature.\(^3\)-\(^6\) One review highlighted that it can be constructed as ‘a trajectory, a continuum, a system, a trait, a process, a cycle and a qualitative category.’\(^3\) Resilience has also been described as an emotional competence and can be considered as behaviour to be acquired during training.\(^4\) Resilience consists of cognitive processes that encompass at least four dimensions: self-efficacy; planning; self-control; commitment and perseverance.\(^5\) As there is no consensus definition of resilience, but in medical education we are focusing on resilience as a trait that can be acquired and so the definition chosen to be used for this review is that of ‘resilience as an emotional competence and can be considered as a behaviour to be acquired during training.’\(^4\)

Developing resilience is particularly important in medicine because of the demanding workloads, societal expectations and political issues.\(^7\) The relationship between developing resilience and student wellbeing has been illustrated in the literature.\(^8\)-\(^10\) Also, there have been studies illustrating the need to develop resilience to avoid physician burnout.\(^11\)-\(^14\) Measures of resilience are reported in the literature and are noted to be effective predictors of how good adults are at using positive emotions to prevent adverse impacts of stressful events.\(^15\)-\(^16\)

An initial scoping study has been conducted and the search strategies are illustrated in Appendix 1. The initial search identified 1857 relevant titles. A review of the abstracts identified 110 potential papers on resilience and these references are provided in Appendix 2. This scoping study has revealed that there is a broad range of different methods of developing resilience including firstly, methods at a personal level such as mindfulness therapy; secondly, faculty development initiatives and thirdly, teaching methods/ models incorporated within the medical curriculum. There is currently no systematic review that has synthesised all the different methods of developing resilience across the continuum of medical education. Therefore, it is anticipated that this review will be of importance to medical educators worldwide in developing methods to enhance resilience within their own institutions.

In summary, although there is a growing body of literature on the importance of resilience, there has been no systematic review of the methods and strategies to develop resilience across the continuum of medical education. Therefore, the aim of this review is to synthesise the evidence of methods available to develop resilience in undergraduate, postgraduate and continuing medical education.
Research Aims

A review of the methods of developing resilience in undergraduate, postgraduate and continuing medical education.

Research Objectives

The objectives for this review are as follows:

1. Identifying methods of developing resilience
2. Synthesise the evidence on the different methods of developing resilience.
3. Develop recommendations for developing resilience in medical education.
4. Develop recommendations for future research in developing resilience.

SEARCH STRATEGY

The databases to be searched include: Medline; PsychInfo; Education Research Complete, Web of Science and Embase. The literature search will be conducted from 2005-2015, as the scoping study revealed that most the literature in medical education is from the last ten years. The medical subject headings (MeSH) and keywords to be used are resilience, resilient, medical education (includes undergraduate, postgraduate and continuing medical education); medical students; medical school; physicians and doctors.

STUDY SELECTION CRITERIA

The focus of the review is on developing resilience in undergraduate, postgraduate and continuing medical education. All primary research studies will be included. Descriptive studies without evaluative methodology will be excluded. Only English Language studies will be included in the review. The search strategy will exclude resilience studies in other healthcare professionals. Hand searching of the journals, Medical Teacher, Academic Medicine and Medical Education will be undertaken.

INITIAL APPRAISAL OF LITERATURE SEARCH

Two authors (VP, SJ) will use the exclusion/inclusion to assess all electronic citations generated by the search and decide on the basis of the title and abstract, whether the citation is relevant to the topic. Clearly irrelevant items will be identified and eliminated, before the full text articles for all potentially relevant citations will be obtained. A second stage will involve the lead reviewer excluding any full text articles which did not meet the inclusion criteria. To ensure that all key studies were included, the reference lists of the final review studies identified through the primary search will be searched by two reviewers for any additional references. All references identified through searching will be entered into an Endnote Online Version 3.12 and duplicate references will be removed, first automatically and then manually.
QUALITY ASSESSMENT OF STUDIES

The methodological quality of each included study will be assessed using the tool validated by the BEME Review on Education Portfolios. This tool will be included within our data extraction sheet. This tool includes eleven quality indicators relating to the appropriateness of the study design, results, analysis and conclusions. Higher quality studies are considered to be those which meet a minimum of eight of these quality indicators, medium quality studies were those that meet six or seven criteria, and low scoring papers are those meeting five or fewer of the criteria. The data extraction sheet to be used is shown in Appendix 3.

DATA EXTRACTION

An initial pilot of the devised data extraction sheet will be conducted by two authors (VP, SJ) each reviewing the same paper. The two authors (VP, SJ) will then independently extract the data from all full text articles selected and the extracted information will be systematically collated onto the data extraction forms. Discrepancies in the total scores will be resolved by discussion and consensus between the two authors.

DATA SYNTHESIS

A thematic analysis will be conducted on methods and strategies of developing resilience across the continuum of medical education. No statistical integration of data findings will be possible due to the predominantly descriptive nature of the results. The findings will be integrated into a narrative structure and a table will illustrate the main emergent themes.

POTENTIAL IMPACT OF THE REVIEW

The aim of this review is to synthesise the evidence currently available on methods of developing resilience across the continuum of medical education. The review will synthesise the evidence for the importance of developing and maintaining resilience in medical education. This review will summarise the evidence of the teaching methods and strategies for developing resilience at an institutional and individual level.

The impact of the review will be to inform educational practice with regard to the development of resilience in undergraduate, postgraduate and continuing medical education. By synthesising the evidence on methods of developing resilience, this review will consider innovative methods to developing resilience. Based on the evidence synthesised in this review, recommendations for best practice in developing resilience in 21st century medical education will be described. Finally, this systematic review will also highlight areas for future educational research on developing and maintaining resilience. It is anticipated that this review will be of importance to medical educators worldwide.
PROJECT TIMETABLE

- Full papers reviewed and completion of coding: January 2016 – March 2016
- Synthesis of findings: April 2016
- Writing of full review: May 2016 – July 2016
- Submission of full review: July 2016

CONFLICT OF INTEREST
The review group members declare no conflict of interests in conducting this study.

PLANS FOR UPDATING REVIEW
The systematic review will be updated annually after completion so to include any new emerging evidence on the development of resilience in medical education.

REFERENCES


APPENDICES

- Appendix 1 : Scoping Study – Search Strategies and Initial Summary
- Appendix 2 : Scoping Study – List of Papers
- Appendix 3 : Data Extraction Sheet
Appendix 1: Scoping Study – Search Strategies and Initial Summary

**Scoping Study - Search Summary Results**

<table>
<thead>
<tr>
<th>Database</th>
<th>Initial search results</th>
<th>De-duplicated results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medline</td>
<td>606</td>
<td>468</td>
</tr>
<tr>
<td>Embase</td>
<td>670</td>
<td>345</td>
</tr>
<tr>
<td>Web of Science</td>
<td>739</td>
<td>371</td>
</tr>
<tr>
<td>PsycInfo</td>
<td>641</td>
<td>439</td>
</tr>
<tr>
<td>Education Research Complete</td>
<td>379</td>
<td>234</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>3035</strong></td>
<td><strong>1857</strong></td>
</tr>
</tbody>
</table>

Medline search strategy:

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>exp Resilience, Psychological/</td>
</tr>
<tr>
<td>2</td>
<td>resilien*.mp.</td>
</tr>
<tr>
<td>3</td>
<td>1 or 2</td>
</tr>
<tr>
<td>4</td>
<td>medical education.mp. or exp Education, Medical/</td>
</tr>
<tr>
<td>5</td>
<td>exp Students, Medical/ or medical student*.mp.</td>
</tr>
<tr>
<td>6</td>
<td>exp Schools, Medical/ or medical school*.mp.</td>
</tr>
<tr>
<td>7</td>
<td>&quot;internship and residency&quot;.mp. or exp &quot;Internship and Residency&quot;/</td>
</tr>
<tr>
<td>8</td>
<td>resicien*.mp.</td>
</tr>
<tr>
<td>9</td>
<td>physician*.mp.</td>
</tr>
<tr>
<td>10</td>
<td>physician.mp. or exp Physicians/</td>
</tr>
<tr>
<td>11</td>
<td>doctor*.mp.</td>
</tr>
<tr>
<td>12</td>
<td>4 or 5 or 6 or 7 or 8 or 9 or 10 or 11</td>
</tr>
</tbody>
</table>
Embase search strategy:

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>resilien*.mp.</td>
</tr>
<tr>
<td>2</td>
<td>exp medical school/ or medical school*.mp.</td>
</tr>
<tr>
<td>3</td>
<td>medical education.mp. or exp medical education/</td>
</tr>
<tr>
<td>4</td>
<td>exp medical student/ or medical student*.mp.</td>
</tr>
<tr>
<td>5</td>
<td>exp physician/ or physician*.mp.</td>
</tr>
<tr>
<td>6</td>
<td>doctor*.mp.</td>
</tr>
<tr>
<td>7</td>
<td>exp residency education/ or exp resident/</td>
</tr>
<tr>
<td>8</td>
<td>2 or 3 or 4 or 5 or 6 or 7</td>
</tr>
<tr>
<td>9</td>
<td>1 and 8</td>
</tr>
</tbody>
</table>

Web of Science search strategy:

(resilien*) AND TOPIC: ("medical student" or "medical school" or "medical education" or physician or doctor or resident or residency)

PsycInfo Search Strategy:

(SU.EXACT.EXPLODE("Resilience (Psychological)") OR resilien") AND
(SU.EXACT.EXPLODE("Medical Students") OR SU.EXACT.EXPLODE("Medical Residency")
OR SU.EXACT.EXPLODE("Medical Education") OR SU.EXACT.EXPLODE("Physicians") OR
(physician" OR doctor" OR "medical education" OR "medical school" OR "medical
student")) AND stype.exact("Scholarly Journals")
Education Research Complete Search Strategy:

<table>
<thead>
<tr>
<th>S5</th>
<th>S1 AND S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>S4</td>
<td>S2 OR S3</td>
</tr>
<tr>
<td>S3</td>
<td>&quot;medical school&quot;* or &quot;medical education&quot; or &quot;medical student&quot;* or physician* or doctor* or resident or residency</td>
</tr>
</tbody>
</table>
| S2  | (((((DE "MEDICAL education"
|     | OR DE
|     | "CHIROPRACTIC -- Study & teaching"
|     | OR DE
|     | "CLINICAL medical education"
|     | OR DE
|     | "DISCRIMINATION in medical education"
|     | OR DE
|     | "HEALTH education"
|     | OR DE "HEALTH occupations schools"
|     | OR DE "MEDICINE -- Study & teaching"
|     | OR DE "NURSING -- Study & teaching"
|     | OR DE "PARAMEDICAL education"
|     | OR DE "FREMEDICAL education"
|     | OR DE "SEX discrimination in medical education")
|     | OR (DE "MEDICAL students"
|     | OR DE "MEDICAL college applicants"
|     | OR DE "WOMEN medical students")
|     | OR (DE "MEDICAL schools"
|     | OR DE "MEDICINE -- Study & teaching"
|     | OR DE "PHARMACY colleges")
|     | OR (DE "PHYSICIANS -- Education")
|     | OR (DE "RESIDENTS (Medicine)")
|     | OR (DE "MEDICAL school graduates") |
| S1  | resilien* |
Appendix 2: Scoping Study – List of Papers


54. Livingstone C. Misunderstanding the meaning of resilience. *BMJ (Online)*. 18 Mar 2015;350(h1423).


74. Probst H, Boylan M, Nelson P, Martin R. Early career resilience: Interdisciplinary insights to support professional education of radiation therapists. *Journal of Medical
76. Prüfer F, Joos S, Miksch A. What Do Resource-Oriented Approaches Mean to General Practitioners and How Can They Be Facilitated in Primary Care? A Qualitative Study. Evidence-Based Complementary and Alternative Medicine. 2013.
93. Slavin SJ, Schindler DL, Chibnall JT. Medical student mental health 3.0: improving
Appendix 3: Data Extraction Sheet

Section 1: Administrative
Reviewer
Authors
Title
Year
University, Country

Section 2: Summary of Papers according to Quality Indicators (details below).

<table>
<thead>
<tr>
<th>Quality Indicator</th>
<th>Score= 0 or 1</th>
<th>Summary</th>
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<tbody>
<tr>
<td>1. Research Question</td>
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<tr>
<td>2. Study Subjects</td>
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<td>3. Data Collection Methods</td>
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<tr>
<td>4. Completeness of Data</td>
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<tr>
<td>5. Control of Confounding</td>
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<tr>
<td>6. Analysis of Results</td>
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<tr>
<td>7. Conclusions</td>
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<tr>
<td>8. Reproducibility</td>
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<td>9. Prospective</td>
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<tr>
<td>10. Ethical Issues</td>
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<td></td>
</tr>
<tr>
<td>11. Triangulation</td>
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<td></td>
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</tbody>
</table>

Total Score = / 11

Section 3: Detail of Method of Developing Resilience
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Section 4: Any other comments regarding the article
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...........................................................................................................................
Quality indicators for all studies.

Quality indicators against which all studies were assessed are given, together with clarification of meaning in each case.

Quality assessment of studies

To assess the quality of included studies, a series of 11 quality ‘indicators’ was developed. These related to the appropriateness of the study design, conduct, results analysis and conclusions. Higher quality studies were considered to be those which met a minimum of 8 of these 11 indicators.

Quality Indicator Detail

1. Research question: Is the research question(s) or hypothesis clearly stated?
2. Study subjects: Is the subject group appropriate for the study being carried out (number, characteristics, selection, and homogeneity)?
3. ‘Data’ collection methods: Are the methods used (qualitative or quantitative) reliable and valid for the research question and context?
4. Completeness of ‘data’: Have subjects dropped out? Is the attrition rate less than 50%? For questionnaire based studies, is the response rate acceptable (60% or above)?
5. Control for confounding: Have multiple factors/variables been removed or accounted for where possible?
6. Analysis of results: Are the statistical or other methods of results analysis used appropriate?
7. Conclusions: Is it clear that the data justify the conclusions drawn?
8. Reproducibility: Could the study be repeated by other researchers?
9. Prospective: Does the study look forwards in time (prospective) rather than backwards (retrospective)?
10. Ethical issues: Were all relevant ethical issues addressed?
11. Triangulation: Were results supported by data from more than one so