Evidence-guided approach to portfolio-guided teaching and assessing communications, ethics and professionalism for medical students and physicians: a systematic scoping review

Jacquelin Jia Qi Ting,1,2 Gillian Li Gek Phua,2,3 Daniel Zhihao Hong,1,2 Bertrand Kai Yang Lam,2 Annabelle Jia Sing Lim,1,4 Eleanor Jia Xin Chong,1,2 Anushka Pisupati,1,2 Rei Tan,1,2 Jocelyn Yi Huang Yeo,1,2 Yi Zhe Koh,1,2 Chrystie Wan Ning Quek,1,2 Jia Yin Lim,1,2 Kuang Teck Tay,2 Yun Ting Ong,1,2 Min Chiam,5 Jamie Xuelian Zhou,2,3 Stephen Mason,6 Limin Wijaya,7 Lalit Kumar Radha Krishna8

ABSTRACT

Objectives Guiding the development of longitudinal competencies in communication, ethics and professionalism underlines the role of portfolios to capture and evaluate the multiple multisource appraisals and direct personalised support to clinicians. However, a common approach to these combined portfolios continues to elude medical practice. A systematic scoping review is proposed to map portfolio use in training and assessments of ethics, communication and professionalism competencies particularly in its inculation of new values, beliefs and principle changes attitudes, thinking and practice while nurturing professional identity formation. It is posited that effective structuring of portfolios can promote self-directed learning, personalised assessment and appropriate support of professional identity formation.

Design Krishna’s Systematic Evidence-Based Approach (SEBA) is employed to guide this systematic scoping review of portfolio use in communication, ethics and professionalism training and assessment.

Data sources PubMed, Embase, PsycINFO, ERIC, Scopus and Google Scholar databases.

Eligibility criteria Articles published between 1 January 2000 and 31 December 2020 were included.

Data extraction and synthesis The included articles are concurrently content and thematically analysed using the split approach. Overlapping categories and themes identified are combined using the jigsaw perspective. The themes/categories are compared with the summaries of the included articles in the funnelling process to ensure their accuracy. The domains identified form the framework for the discussion.

Results 12300 abstracts were reviewed, 946 full-text articles were evaluated and 82 articles were analysed, and the four domains identified were indications, content, design, and strengths and limitations.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The Systematic Evidence-Based Approach methodology adopts the structure of systematic reviews and flexibility of narrative reviews to synthesise a reproducible and accountable evaluation of diverse methodological sources, settings, physician populations and specialties.

⇒ This review evaluates the impact of longitudinal development of communications, ethics and professionalism competencies and their impact on professional identity formation.

⇒ Given that communications, ethics and professionalism are sociocultural constructs, geopolitical and sociocultural differences may raise questions as to the applicability of these findings beyond the European and North American medical education systems.

⇒ As the number of articles included is limited, the review’s ability to assess the long-term effectiveness of portfolios may be compromised.

Conclusions This review reveals that when using a consistent framework, accepted endpoints and outcome measures, longitudinal multisource, multimodal assessment data fashions professional and personal development and enhances identity construction. Future studies into effective assessment tools and support mechanisms are required if portfolio use is to be maximised.

INTRODUCTION

Evidence for the effective embodiment of ethical and professional principles, communication skills and appropriate use of empathy in clinical practice requires a
longitudinal and often multisource perspective. With ethics and professionalism sharing longitudinal developmental trajectories and intimately entwined with communication skills and competencies, the three competencies are increasingly considered together. In practice longitudinal communication, ethics and professionalism (CEP) programmes appear in the curricula of the top 10 medical schools featured on the QS World University Rankings 2020. Concurrent study of CEP is also underpinned by their common sociocultural roots. As sociocultural constructs, CEP competencies are shaped by the individual’s personal experiences, motivations, enthusiasm, idealism, abilities, competencies, virtues, expectations, knowledge, skills, emotions and attitudes (henceforth narratives); their values, beliefs and principles (henceforth belief systems); their clinical experiences, competencies, training, insights and confidence (henceforth clinical insights); and their practice, clinical, social, cultural, academic, research and personal considerations (henceforth contextual considerations).

However, while previous reviews into the teaching of ethics, communication and professionalism suggest the use of portfolios could provide a personalised, holistic and longitudinal perspective of CEP skills, knowledge and attitudes and support of developing competencies, we are aware of little progress in designing such platforms. Impetus for mapping current use of CEP portfolios also arises from the notion that developing CEP competencies shapes how medical students and physicians (henceforth clinician) ‘think, act and feel like a physician’ or their professional identity formation (henceforth PIF). It is posited that the promise of CEP portfolios with better appreciation of evolving self-concepts of professional identity will better direct support and even remediation of professional, ethical, communication and interprofessional development and PIF. This is especially pertinent at a time of increasing reports of breaches in standards, codes of conduct, and social and practice expectations.

METHODS
A Systematic Evidence-Based Approach (SEBA) guided Systematic Scoping Review (SSR) (henceforth SSR in SEBA) is proposed to map CEP portfolio use in medicine to guide the design, structuring and support of a proposed programme. Given space constraints, we briefly describe the six stages in the construction of SSRs in SEBA in figure 1 and more advanced details of the systematic approach, split approach, jigsaw perspective, funnelling process, reiterative process and synthesis of SSR in online supplemental appendix A.

Stage 1 of SEBA: systematic approach
Determining of title and background of the review
An expert team comprised of a medical librarian from the Yong Loo Lin School of Medicine (YLLSoM) at the National University of Singapore and local education experts and clinicians at the National Cancer Centre Singapore (NCCS), the Palliative Care Institute Liverpool, YLLSoM and Duke-NUS Medical School (henceforth the expert team) supported the research team in designing and overseeing the SEBA process.

Identification of research question
The research and expert team determined the primary research question: ‘What is known about CEP portfolios?’ The secondary research questions were ‘what role do CEP portfolios have in teaching and assessing CEP development?’

Inclusion criteria
A population, intervention, comparison and outcome (PICO) format, outlined in table 1, was used to guide the research process.

Identification of relevant studies
The research team developed search strategies and carried out independent reviews for relevant publications in the PubMed, Embase, PsycINFO, ERIC, Scopus and Google Scholar databases (search strategy enclosed in online supplemental appendix B). Keeping with Pham et al’s approach of ensuring a feasible and sustainable research process, the team contained the search to articles published between 1st January 2000 and 31st December 2020 to accommodate existing human resource and time constraints and ensure a sustainable review process.

Selection of studies included in review
Six members of the research team created individual lists of titles to be included, while three other members of the research team carried out hand searches and ancestry searches of seven leading journals in medical education (Academic Medicine, Medical Education, Medical Teacher, Advances Health Sciences Education, BMC Medical Education, Teaching and Learning in Medicine and Perspectives on Medical Education) accessed through the National
Table 1  PICOS inclusion and exclusion criteria

<table>
<thead>
<tr>
<th>PICOS</th>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Undergraduate and postgraduate medical students.</td>
<td>Allied health specialties such as pharmacy, dietetics, chiropractic, midwifery, podiatry, speech therapy, occupational and physiotherapy.</td>
</tr>
<tr>
<td></td>
<td>Qualified medical doctors, physician or resident; medical officer, registrar, house officer, attending and consultant.</td>
<td>Non-medical specialties such as clinical and translational science, alternative and traditional medicine, veterinary and dentistry.</td>
</tr>
<tr>
<td>Intervention</td>
<td>Portfolios in undergraduate and postgraduate medical education for teaching and assessment of communication, ethics and professionalism.</td>
<td>Other documentation methods or learning tools that are:</td>
</tr>
<tr>
<td></td>
<td>Criteria of a portfolio:</td>
<td>▶ Not longitudinal or single timepoint.</td>
</tr>
<tr>
<td></td>
<td>▶ Longitudinal (more than a single timepoint) assessment data.</td>
<td>▶ Does not include personal intellectual engagement with the content and associated learning (for instance, curriculum vitae, logbooks and the use of personal digital assistants).</td>
</tr>
<tr>
<td></td>
<td>▶ Candidate’s personal engagement with portfolio content and associated learning.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Interventions meeting the above criteria were included regardless of whether they were referred to as portfolios.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All types of portfolios were included in the study:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ For instance: electronic and non-electronic; formative and summative or combined; clinical and non-clinical.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Portfolios with input from students and/or residents and/or doctors and/or input from faculty members and other individuals.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Portfolios with different structures: extent by which the structure has been prescribed and/or left to individual discretion.</td>
<td></td>
</tr>
<tr>
<td>Comparison/context</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Outcome</td>
<td>Papers that measured the following outcomes were included:</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>▶ Effectiveness of the use of portfolios to assess and teach communication, ethics and professionalism.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Impact of the use of portfolios on medical students (both undergraduate and postgraduate).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Impact of the use of portfolios on the faculty.</td>
<td></td>
</tr>
<tr>
<td>Study design</td>
<td>Articles in English or translated to English.</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Articles published from 1st January 2000 to 31st December 2020.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All study designs including: mixed methods research, meta-analyses, systematic reviews, randomised controlled trials, cohort studies, case-control studies, cross-sectional studies, descriptive papers, grey literature, opinions, letters, commentaries and editorials.</td>
<td></td>
</tr>
</tbody>
</table>
University of Singapore (NUS) library portal. These individual lists of titles were discussed online and Sandelowski and Barroso’s ‘negotiated consensual validation’ approach to ‘articulate, defend, and persuade others of the “cogency” or “incisiveness” of their points of view or show their willingness to abandon views that are no longer tenable’ was applied to achieve consensus on the final list of titles to be scrutinised.

Assessing the quality of articles
Eight research team members individually appraised the quality of the quantitative and qualitative studies using the Medical Education Research Study Quality Instrument and Consolidated Criteria for Reporting Qualitative Studies.

Stage 2 of SEBA: split approach
Two teams carried independent and concurrent thematic and content analysis of the included articles while a third team created tabulated summaries based on recommendations drawn from Wong et al, RAMESES publication standards: meta-narrative reviews, and Popay et al’s ‘Guidance on the conduct of narrative synthesis in systematic reviews’. The categories employed in the content analysis for undergraduate communications were Rider et al’s ‘A model for communication skills assessment across the undergraduate curriculum’, Goldie’s ‘Review of ethics curricula in undergraduate medical education’, Duffy et al’s ‘Assessing Competence in Communication and Interpersonal Skills: The Kalamazoo II Report’ and Hong et al’s ‘Postgraduate Ethics Training Programs: A Systematic Scoping Review’. Tay et al’s ‘Assessing Professionalism in Medicine - A Scoping Review of Assessment Tools from 1990 to 2018’ was employed for codes for professionalism, and Friedman Ben David et al’s article ‘AMEE Medical Education Guide No. 24: Portfolios as a method of student assessment’ was then used to contextualise their use in portfolios.

Stage 3 of SEBA: the jigsaw perspective
The jigsaw perspective sees the themes and categories identified compared and combined where overlaps and similarities exist.

Stage 4 of SEBA: the funnelling process
The funnelling process sees the themes/categories created from the jigsaw approach compared with the tabulated summaries to determine their consistency.

Patient and public involvement
Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of our research.

RESULTS
A total of 12300 abstracts were reviewed, 946 full-text articles were evaluated and 82 articles were analysed (figure 2). The funnelled domains identified are: (1) indications, (2) portfolio content, (3) portfolio design and implementation and (4) strengths and limitations. In keeping with its goals of transparency and accountability, these tables are enclosed in online supplemental appendix C.

Funneled domain 1: indications
CEP portfolios curate longitudinal multisource, multimodal assessment data taken at different settings and contexts allowing it to serve two main roles: teaching and assessment (table 2). However, few span undergraduate and postgraduate education. As assessment tool CEP portfolios assist in the identification of areas of weakness and guide the provision of a comprehensive, targeted feedback, support and remediation. Most CEP assessment portfolios in postgraduate education focus on evidencing the attainment of required competencies, capturing reflections and indications of PIF. CEP portfolios in the postgraduate setting have also been used for revalidation purposes.

As a teaching tool, CEP portfolios encourage self-directed learning, self-improvements, reflective practice, motivate practitioners to achieve desired competencies, and bolster overall professional and personal development.
Funneled domain 2: characteristics

The contents of portfolios were shaped by their overall function (table 3). Expectations about the nature and assessments of the contents facilitate personalisation of portfolios (113). Postgraduate CEP assessment portfolios inject more details on undergraduate portfolios. Table 4 summarises these elements include communication skills, addressing ethical issues and compliance of professional, institutional and departmental policies (113). Greater detail in postgraduate CEP assessment portfolios sees the addition of modified essay questions, polypharmacy journal/audits, professional workshops and training sessions.
health service meeting reports and reviews by medical regulatory authorities. A detailed summary is provided in online supplemental appendix D.

**Funnelled domain 3: strengths and limitations**
The strengths and limitations of portfolios are outlined in **table 5**.

Postgraduate portfolios provide greater insights into lifelong learning and continuous professional development. Use of multi-source assessments at multiple timepoints in clinical settings see postgraduate portfolios provide good inter-rater reliability. Postgraduate portfolios also detect stress and burnout.

**Stage 5 of SEBA: analysis of data and non-data driven literature**
Findings from the different stages of SEBA were discussed with members of the expert team and relevant stakeholders. There were concerns from the expert team about the impact of grey literature on the narrative, given that they were neither peer reviewed nor necessarily evidence based. As a result, the research team differentiated correspondence, letters, editorials and perspective pieces from...
academic databases and grey literature from data-driven or research-based peer-reviewed data. Both groups were then independently analysed. The themes/categories identified were then compared with enhance further the accountability and the reproducibility of stage 5 of SEBA. Evidence-based data from bibliographic databases (henceforth evidence-based publications) were separated from grey literature, perspectives, editorials, letters and non-data-based articles drawn from bibliographic data- bases (henceforth non-data driven). These two groups were separately thematically analysed.

Stage 6 of SEBA: synthesis of the discussion

The Best Evidence Medical Education Collaboration Guide and the Structured approach to the Reporting In healthcare education of Evidence Synthesis were used to guide the discussion.

### DISCUSSION

This SSR in SEBA suggest that overlaps in ethics, professionalism and communication skills, knowledge, attitudes and competencies reaffirm the concurrent training and assessments of CEP competencies in portfolios. To be effective CEP teaching and longitudinal assessment portfolios require a consistent framework replete with clearly delineated goals, aligned expectations, predetermined assessment criteria for specified competencies, agreed on endpoints and outcome measures and the curation, structuring and organisation of longitudinal multisource, multimodal assessment data. The combination of these data facilitate training, assessment, feedback and holistic and longitudinal support, guide reflection and bolster professional and personal

<table>
<thead>
<tr>
<th>Table 4 Portfolio content (competencies assessed and assessment modalities)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication</strong></td>
</tr>
<tr>
<td><strong>Common competencies assessed</strong></td>
</tr>
<tr>
<td><strong>Assessment (formative/summative/ mixed)</strong></td>
</tr>
</tbody>
</table>
development. Critically, the employ of consistent and agreed on structure, goals, purpose, role, learning objectives, content and assessment guidelines also affords users with a personalised perspective of their CEP development on which they can reflect on and glean insights and feedback.

Yet to be effective, CEP portfolios require policing and underscore the need for trained and dedicated faculty capable of effective role modelling and providing feedback, and who appreciate the individual’s current concepts, narratives, motivations, abilities and availabilities and contextual considerations. Furthermore, the efficacy of portfolios and their ability to meet the stated objectives stated in table 2 and realise their stated benefits in table 5 are reliant on the appropriate mix of assessment methods employed, the frequency of assessments, the efficacy of analysis and the quality of the feedback, support and remediation provided should it be required. This in turn highlights the role of the host organisation in ensuring effective oversight of the programme and assessments and in ensuring that faculty are afforded protected time for administrative duties, coordination and assessments particularly given the longitudinal nature of CEP portfolios. It should not be forgotten that CEP portfolios reflect the development of an individual and such changes should be measured and contextualised within the wider education, training, practice, professional, research, clinical, interprofessional team based and organisational perspective.

This further underlines the importance of the host organisation’s role in assessing and guiding development of CEP competencies.

With these requisites met, evidence of changes in CEP knowledge, skills and competencies suggests a shift in the thinking, attitudes and conduct of clinicians. The Krishna-Pisupati model posits that sustained changes in practice, beliefs, values and principles will result in changes in the clinician’s belief systems which, in turn, inform their self-concepts of identity and shape their PIF.

**LIMITATIONS**

The generalisability of the results of this study is limited by the identified studies selected for review. First, the majority of the papers included originate from Europe and North America. Given that CEP is a sociocultural construct, these geopolitical sociocultural differences raise questions as to the applicability of these findings beyond the European and North American medical education systems. Second, as the number of articles included is limited, the SSR in SEBA’s ability to assess the long-term effectiveness of portfolios may be compromised.

**CONCLUSIONS**

The suggestion that CEP portfolios can capture, instruct and assess PIF requires further study. While there have been posits on how such evaluations could be made, such
tools remain unrealised and must be the focus of coming studies. One possible starting point for the design of such tools may be theories such as the Krishna-Pisupati model, which attempts to link PIF to changes to belief systems and concepts of personhood. This may provide a grander view of PIF that spans the undergraduate and postgraduate settings and provide the basis for directing support and feedback for clinicians. As we look forward to furthering efforts to study the effects of CEP portfolios on the PIF of clinicians, we also believe the specific impact of these potentially resource-heavy and financially costly intervention should be at the centre of future initiatives.

Author affiliations
1 Yong Loo Lin School of Medicine, National University of Singapore, Singapore
2 Division of Supportive and Palliative Care, National Cancer Centre Singapore, Singapore
3 Lien Centre for Palliative Care, Duke-NUS Medical School, Singapore
4 Department of Supportive and Palliative Care, National Cancer Centre Singapore, Singapore
5 Division of Cancer Education, National Cancer Centre Singapore, Singapore
6 Palliative Care Institute Liverpool, University of Liverpool, Liverpool, UK
7 Department of Infectious Diseases, Singapore General Hospital, Singapore
8 Duke-NUS Medical School, Singapore

Acknowledgements
The authors would like to dedicate this paper to the late Dr S Radha Krishna and Assistant Professor Cynthia Goh, whose advice and ideas were integral to the success of this review and to Thondy, Maia Olivia and Raja Kamarul Ariffin, whose lives continue to inspire us. The authors would also like to thank the anonymous reviewers, Dr Ruaraidh Hill and Dr Stephen Mason for their helpful comments that greatly enhanced this manuscript.

Contributors
JJOJ, GLGP, DHZ, BKYL, ASJL, ELJX, AP, RT, JIHY, YZK, CWNO, JYL, KTT, YTO, MC, XJ, SM, LW and LKRK were involved in data curation, formal analysis, investigation, preparing the original draft of the manuscript as well as reviewing and editing the manuscript. LKRK is the guarantor. All authors have read and approved the manuscript.

Funding
The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests
None declared.

Patient and public involvement
Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication
Not applicable.

Ethics approval
Not applicable.

Provenance and peer review
Not commissioned; externally peer reviewed.

Data availability statement
No data are available.

Supplemental material
This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access
This is an open access article distributed in accordance with the Creative Commons Attribution 4.0 Unported (CC BY 4.0) license, which permits others to copy, redistribute, remix, transform and build upon this work for any purpose, provided the original work is properly cited, a link to the licence is given, and indication of whether changes were made. See: https://creativecommons.org/licenses/by/4.0/.

ORCID iDs
Gillian Li Gok Phua http://orcid.org/0000-0002-2034-9723
Lalit Kumar Radha Krishna http://orcid.org/0000-0002-7350-8644

REFERENCES


