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Remediating professionalism lapses in medical students and doctors: A systematic review

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Abstract (300/300 Words)

Background

A remediation intervention aims to facilitate the improvement of an individual who has dropped below the expected level of competence regarding a particular skill. Little is known regarding the effectiveness of remediation, especially in the area of professionalism. This review sought to identify and assess the effectiveness of interventions to remediate professionalism lapses in medical students and doctors.

Methods

The EMBASE, MEDLINE, ERIC and BEI databases were searched up until October 2018. Studies reporting interventions to remediate professionalism lapses in medical students and doctors were included. A standardised data extraction form incorporating Michie's Behaviour Change Techniques (BCT) taxonomy was utilised. A narrative synthesis approach was adopted. Quality assessment was made using CASP.

Results

19 remediation interventions reported in 23 articles, were identified. 13 were case-studies, 5 were cohort studies and 1 was a qualitative study. 37% targeted doctors, 26% medical students, 16% residents and 21% were mixed populations. Most interventions were multifaceted, addressing professionalism issues concomitantly with clinical skills, while some focused on specific areas e.g. sexual boundaries or disruptive behavior. Most used 3 or more BCT's. The included studies were predominantly of low quality as 13/19 were case-studies. It was difficult to assess the effectiveness of the interventions as the majority did not carry out any evaluation.

Conclusion

The review identifies a paucity of evidence to guide best practices of remediation of professionalism lapses in medical students and doctors. The literature tentatively suggests that remediating lapses in professionalism, as part of a wider programme of remediation, can facilitate participants to graduate from a programme of study, pass medical licensing and mock oral board examinations. However, we cannot tell from this literature whether these interventions are successful in remediating lapses in professionalism specifically. Further research is required to improve the design and evaluation of interventions to remediate professionalism lapses.

1. Introduction

The lives of patients are dependent on the safe and effective performance of the doctors entrusted with their care. If a doctor is underperforming, patients may be at risk. [1-3] It is estimated that around 6% of doctors in the hospital workforce at any time may be performing below the standard that is expected of them.[4] Doctors can experience performance issues at different stages in their career for many different reasons. The types of performance issues they experience are often multifactorial involving knowledge, skills and/or professional behaviors.[5]

Remediation interventions are widely used in healthcare systems across the globe to address underperformance. In England for example, it is estimated that around 2% of all practicing doctors will be undergoing remediation at any one time.[6: 24] Remediation involves "remedying" a doctor's poor performance during which the doctor is returned to safe practice. [7] Remediation can be defined as an intervention or a range of interventions "required in response to assessment against a threshold standard of performance".[8: 434] Remediation interventions vary from informal agreements to undertake some reskilling to, more formal programmes of remediation and rehabilitation, with most based around a 3 step model[6]: identification of performance deficit, the implementation of a remediation intervention and retesting after intervention.[9] Given that doctors are both expensive to train and in short supply, remediating a doctor who is underperforming and returning them to safe practice may be both a more practical and financially viable option than removing the doctor from practice altogether.[10, 11]

Remediation has been classified as a 'wicked' problem the medical profession has struggled with for decades.[12] One of the causes of this 'wicked' problem relates to the fact that remediation has tended to be conceptualized as an educational issue, however few studies are underpinned by educational theory.[13, 14] Recent work by Prescott-Clements et al has shown how conceptualizations have moved towards the use of behavioural change theories to underpin remediation models. We conceptualized

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remediation as a behavior change intervention[5] as a large part of professionalism relates to behaviours.[5, 12-14]

There has been an increased awareness of the importance of professionalism, and remediating professionalism lapses, in medical education over the last 30 years.[15, 16] Despite the difficulty of defining professionalism,[17] some degree of consensus has emerged regarding the domains of professional practice. A 2009 review by Wilkinson clustered the various attributes of professionalism into 5 categories: – "adherence to ethical practice principles, effective interactions with patients and with people who are important to those patients, effective interactions with people working within the health system, reliability, and commitment to autonomous or improvement of competence in oneself, others and systems".[18: 551] These themes around honesty, integrity, respect, and a commitment to high standards of practice, feature in the definitions of professionalism in a number of medical regulators, including the General Medical Council (GMC) in the UK,[19] the Accreditation Council for Graduate Medical Education in the United States,[20] and Association of Faculties of Medicine of Canada.[21]

While competency-related performance deficiencies can be identified and remediated in the majority of cases, a study of medical students by Brokaw at the Indiana School of Medicine found that deficiencies in professionalism and self-awareness are particularly difficult to remediate.[22] Using data that covered a ten year period, the study found that not only were professionalism and self-awareness the two most prevalent performance issues, but they also recurred more regularly than any other competency-related deficiencies.[22]

Remediating lapses in professionalism is therefore an important topic in medical education.[23] A systematic review of the remediation of medical students and trainees was conducted by Cleland et al in 2013,[14] but this study focused on the remediation of knowledge and skills rather than professionalism attributes.[14] Papadakis et al have noted that there is a particular lack of available guidance for institutions that seek to remediate lapses in professionalism.[24] This is particularly concerning given that lapses in professionalism are usually more difficult to remediate.[25 22] Furthermore, it has been

found that lapses in professionalism are linked to mental health issues and burnout in medical students and doctors.[26] To our knowledge, there have been no systematic reviews published to date that identify and evaluate existing interventions to remediate professionalism lapses in doctors.[9] Our review question is as follows:

What interventions are used to remediate lapses in professionalism in medical students and doctors and what is the evidence for their effectiveness?

By synthesizing the evidence on this topic, the review will facilitate the ability of organisations to design remedial interventions for individuals with professionalism lapses as well as identify avenues for future research.

2. Methods

2.1 Search Strategy

As the review focused on educational interventions to remediate doctors and medical students, the medical databases MEDLINE and EMBASE and educational databases Education Resources Information Centre (ERIC) and British Education Index (BEI) were searched for relevant articles. The searches were carried out on the 13th of September 2017 and then updated on the 1st of October 2018. We searched for relevant items between 1990 and 2018. The search terms were developed around three concepts, namely remediation, doctors and professionalism. The databases were searched for a variety of free text keywords relating to these concepts. Subject headings relevant to each database were also used for example MeSH and Emtree. See Appendix 1 for details of the search used in MEDLINE.

Bibliographies of included papers identified by our search of electronic databases were searched for relevant items by NB. Abstracts for potentially relevant papers were sought. The inclusion criteria were then applied to these papers.

2.2 Screening & Study Selection

Studies were included that contained an intervention to remediate the professionalism lapses of doctors or medical students. The inclusion criteria are outlined in Table 1. The potential relevance of all titles and abstracts was assessed by three reviewers independently. NB screened all articles with the second screen being shared by JB and TP. Any discrepancies were discussed until agreement was reached. NB held the casting vote.

When selecting studies for inclusion in the review, a large number of papers returned in the database search contained models of remediation interventions or strategies for remediation interventions. Through discussions with the full review team we decided that it was important to differentiate between actual remediation interventions that had been implemented and models or strategies that contained advice about what a remediation intervention should include. This differentiation was a challenge and was addressed through frequent consultations between members of the review team. The team decided that only interventions that had been implemented would be included in the review.

2.3 Data Extraction and Quality Appraisal

All potentially relevant articles were obtained and read in full. The data were extracted independently by three review authors (NB, JB & TP). NB extracted the data for all articles. JB and TP shared the second round of data extraction. Any discrepancies were discussed until agreement was reached. A standardised data extraction form was designed using the Centre for Review and Dissemination guidelines for developing data extraction forms. [27] The Critical Appraisal Skills Programme (CASP) study design definitions were used to classify the included studies as this tool was used for quality appraisal.[28] Similar to Lacasse et al [29] the interventions were characterised using Michies taxonomy of behavior change techniques (BCTs).[30] This framework facilitates comparison across studies by specifying and reporting the aspects of the intervention designed to bring about change. The outcomes examined in the evaluations of the interventions were classified using an adapted version of the Kirkpatrick Hierarchy.[31, 32]

This framework is used for classifying studies according to the outcomes measured. Level 1 describes findings that report on how participants reacted to the intervention. Level 2 describes findings that report on the acquisition of knowledge and skills. Level 3 relates to findings that report on changes to behaviour, and level 4 considers observed benefits to patient care as a result of the intervention.

In order to evaluate the quality of a study the CASP[28] checklist quality appraisal tool was used.[33] These checklists, one for each unique study type, are used to quality appraise the literature, enabling reviewers to ascertain the strength of the evidence base for the knowledge claims made in the review.[33]

2.4 Evidence Synthesis

The evidence synthesis used a narrative approach as described by Popay et al,[34] organising extracted data under headings relevant to the research question. The use of narrative synthesis is a well recognized methodology for investigating heterogeneity across primary studies. It also helps develop an understanding of the different aspects of an intervention which may be responsible for its success.[34] Popay's 3 steps of narrative synthesis as described were followed:[34]

1. The results were described, with studies organised into patterns.

2. Relationships within and between studies were explored.

3. The robustness of the synthesis was assessed, in particular looking for any potential bias within the review.

2.5 Reporting of Review

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist was utilised to ensure the systematic review was rigorously reported.[35]

3. Results

3.1 Literature Identified

Of the 2,319 articles found, 23 articles were included in the study through duplicate review of titles, abstracts and full texts (Figure 1 PRISMA Diagram). Some of the interventions identified in the literature were reported in two or more articles. Where

this was the case the information from each report was combined and counted as one intervention.

3.2 Description of Studies

The characteristics of the included articles are presented in Table 2. Of the 23 articles included in the review, 19 interventions that addressed professionalism lapses in medical students and doctors were reported. Four of the interventions were double reported. All but one of the included studies were carried out in the USA. The majority of articles used a case study design (13/19), five were cohort studies and one was a qualitative study. The target populations for the interventions were doctors solely (37%), medical students solely (26%), residents (16%) medical students, residents, fellows and attending physicians (16%) and others i.e. dentists, healthcare professionals (5%). The interventions were designed and implemented by a variety of organisations including medical schools (42%), Continuing Medical Education (CME) centres (26%), hospital's (16%) and other types of medical centres (16%).

A variety of areas of professionalism were addressed by the interventions. The majority of interventions addressed professionalism broadly alongside other clinical skills e.g. knowledge, life-long learning, self-awareness and time management (37%). 21% addressed professionalism issues generally. 21% addressed boundary violations/medical ethics e.g. sexual and financial boundaries. Some interventions addressed very specific aspects of professionalism e.g. communication (11%) and disruptive behavior (10%).

The content and format of the remediation interventions varied considerably across the studies (see Table 2). The majority of interventions were multifaceted using mixed approaches to identifying and evaluating the performance issue and teaching. The first phase of many of the interventions involved establishing the nature of the professionalism issue. This was often achieved through multi-source feedback[3, 22, 24, 36-38] or psychometric testing.[37, 39] Some of the interventions used didactic teaching methods[40, 41], while others used more integrated teaching methods such as small group learning [42-44], simulation and role-play. [3, 36, 43] Many interventions involved developing

learning plans[22, 38, 45-48] that in most cases were 'individualised' or 'customised' to the participants individual developmental needs. Some interventions used a coaching model[3, 24, 48] where participants undergoing remediation were supported by a coach throughout the process. Reflection was an important activity of many of the interventions.[23, 36, 38, 40, 43, 46, 49]

The 19 interventions involved a range of BCT techniques from one to five with an average of 3. Four interventions included five BCT's , five included four BCT's and 7 included 3 BCT's, two included two BCT's and one included one BCT. The most popular BCT was instruction on how to perform the behavior (19%) goal setting (18%), feedback on followed by problem solving (16%).

Of the five interventions that were evaluated using a cohort design, four reported that remediation was successful for >90% of the remediated individuals. Four of the five studies concerned medical students and only one concerned practicing doctors. The five cohort studies examined professionalism alongside knowledge and clinical skills.

3.3 Quality Assessment

The majority of articles used a case study design (n= 13/19). While case studies and case reports can make important contributions to a field of knowledge, for the purposes of synthesis they constitute low level evidence. As such, case studies do not feature on existing models of hierarchies of evidence[50] and there are subsequently no quality assessment available to evaluate these studies. The six remaining study designs, consisting of five cohort studies and one qualitative study, were quality assessed using CASP checklists.[28] The quality assessment using CASP is presented in Table 3.

Using the Kirkpatrick framework to classify the outcomes examined in the evaluation of the remediation intervention found that two articles examined participants' reactions and acquisition of knowledge and skills (level 1 and 2b) (Table 3). Two examined modification of knowledge and attitudes, and acquisition of knowledge and skills (level 2a and 2b). The remaining study examined acquisition of knowledge and skills (level 2b).

4. Discussion

4.1 Statement of Principal Findings & Comparison with Existing Literature

The aim of this systematic review was to identify existing interventions to remediate lapses in professionalism in medical students and doctors and to assess the evidence for their effectiveness. We identified a small body of literature, nearly all from the USA, relevant to answering our review question (23 studies reporting on 19 individual interventions). The majority of interventions addressed professionalism alongside clinical skills while some focused on specific areas e.g. ethical boundaries and disruptive behavior. The interventions were multifaceted using mixed approaches to evaluation of the performance issue and as well as teaching approaches. The literature tentatively suggests that remediating lapses in professionalism, as part of a wider programme of remediation, can work to facilitate medical students and doctors to graduate from a programme of study and pass medical licensing examinations.   Due to the low quality of studies and a lack of effective evaluation, we cannot tell from this literature whether these programmes are successful in remediating lapses in professionalism specifically.

It is worth commenting on the small number of identified interventions in the literature that have been designed to address professionalism problems solely (n=12). This can be illustrated with a comparison to Cleland et al.'s systematic review that, in 2013, identified 31 studies describing knowledge and skills remediation interventions.[14] This relatively small number of interventions addressing lapses in professionalism is quite surprising given professionalism has been identified as a key area many medical students and doctors experience performance issues[22, 51], is linked to medical students and doctors mental health[26] and is also generally considered more challenging to remediate.

The lack of research on professionalism remediation is all the more concerning given that professionalism issues may be more prevalent than reported in the literature. Data from the National Clinical Assessment Service, who provide extensive remediation assessment and design services for medicine, dentistry and pharmacy in the UK, have found that the majority of cases typically present with multifactorial performance

concerns. However, after comprehensive assessment they have found that communication and behavioural problems were present in around half the cases.[52] This may be because problems that manifest as clinical skills or knowledge issues in the workplace could be rooted in professionalism issues, such as a disregard for the importance of guidelines of for keeping up to date in practice.[52]

It was difficult to assess the effectiveness of the interventions due to the low quality of the identified studies. The majority of the reported interventions used a case study design (73%) providing an in-depth description of the remediation intervention but without an evaluation of the effectiveness of the intervention. The relative lack of evaluation may be because professionalism is simply more difficult to measure.[18] While some longitudinal studies have sought to ascertain a link between professionalism lapses and performance in USLME examinations, such an outcome measure would not serve to evaluate the success of a professionalism intervention. In fact none of the studies report any outcome measure directly related to professionalism at all.

Cleland et al's[14] systematic review also concluded that the majority of their studies were of low quality. The studies included in Cleland's review were mainly cohort or case control study's with case-study's being excluded, highlighting the even lower quality of evidence in our review in comparison. This possibly points to the difference between the remediation of knowledge/clinical skills versus professionalism in that there appears to be more studies of a higher quality on remediating knowledge and clinical skills compared to professionalism. Again, this could be related to the difficulty of defining and measuring professionalism[18] compared to the relatively more straightforward process of defining and measuring knowledge and clinical skills.

Of the few studies that did carry out an evaluation, an important point to note is that that they only evaluated learners' reaction and acquisition of professionalism and clinical knowledge and skills , with no studies seeking to objectively measure behaviour change. This is quite a paradox, as professionalism lapses are often rooted in behavioral deficiencies. This could also be related to the fact that only lately has remediation begun to be conceptualized using behavior change theories.[5]

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While accepting that professionalism lapses are more difficult to remediate and to measure than those pertaining to knowledge and skills, there is evidence that professionalism can be measured through feedback tools in the workplace.[53] Indeed, the increasing use of multi-source feedback in the workplace is driven in large part by the recognition of its effectiveness in completing this task.[54, 55] This suggests that, given the recognised importance of professionalism lapses for more general performance as well for potential ethical violations, there is room for more robust measurements of professionalism to evaluate the success or otherwise of remediation interventions. There is also room to examine in more detail, and in a way that is informed by a theoretically rich understanding of behaviour change, how professionalism is remediated.

4.2 Strengths & Limitations of Study

The mains strength of this review is the systematic approach adopted to conduct the review. Systematic review guidelines including the CRD's and PRISMA were adhered to. A comprehensive search strategy was adopted searching both medical and educational databases in order to locate all studies relevant to the research question. All of the literature identified was independently double screened and data extraction was also independently extracted by two people. An established taxonomy developed by Michie was used to characterise the behavior change techniques adopted in the interventions. The review was carried out by researchers with social science (NB, TP, JA) and clinical backgrounds (JA, JB).

The main limitation of the study relates to the lack of good quality studies with robust evaluations to assess the effectiveness of the remediation interventions has impacted on the quality of the review. The literature from other healthcare sectors e.g. nursing, dentistry could have been explored however this was not the focus of the review. Grey literature databases were not searched. Another limitation relates to the fact that this review is about medical students and qualified doctors and we do not distinguish between the two. There may be differences between failing as a student and as a practising doctor with each having very different consequences.

4.3 Recommendations for Further Research

This study has identified the need for the design, implementation and robust evaluation of interventions to remediate professionalism lapses. In particular, the 'active ingredient' or behavior change technique'(s) needs to be explicitly described and evaluated. Nested qualitative process evaluations would help with this issue as would longitudinal studies on a large number of participants.

Despite our study including all study designs there was very little that contributed to our understanding of why or how particular behavior change techniques produced their effect. This could be addressed by a different type of literature review called Realist Review.[56] Realist review methods are designed to work with complex social interventions or programme's and through the development of a programme theory it provides an explanation of what works, for whom, in what respects and why. There is a need for research that provides a firm theoretical base to help design effective interventions to remediate professionalism lapses in doctors in different contexts.[7] NB, TP and JA are currently leading a study funded by the NIHR exploring this issue.[11]

5. Conclusion

This review has made a significant contribution to the literature by establishing the current state of knowledge on interventions to remediate professionalism lapses in medical students and doctors. The literature tentatively suggests that remediating lapses in professionalism, as part of a wider programme of remediation, can work to facilitate medical students and junior doctors/residents to graduate from a programme of study and pass medical licensing examinations but we cannot tell from this literature whether these interventions are successful in remediating lapses in professionalism specifically. The findings of the study reveal a paucity of evidence to guide best practices of remediation of professionalism lapses in medical education at all levels. Further research is required to improve the quality and effectiveness of remediation interventions.

Word Count
(3,498 words without references)

6. References

[1]   Leape LL, Woods DD, Hatlie MJ, Kizer KW, Schroeder SA, Lundberg GD. Promoting patient safety by preventing medical error. *Jama*. 1998;**280**:1444-1447.

[2]   Kalet A, Chou CL. *Remediation in medical education* Springer; 2014.

[3]   Guerrasio J, Broadfoot KJ, Aagaard EM. Using simulation to remediate poor professional behaviors. *Journal of General Internal Medicine*. 2016;**1)**:S853-S854.

[4]   Cox J. *Understanding doctors' performance* Radcliffe Publishing; 2006.

[5]   Prescott-Clements L, Voller V, Bell M, Nestors N, van der Vleuten CP. Rethinking remediation: a model to support the detailed diagnosis of clinicians' performance problems and the development of effective remediation plans. *Journal of Continuing Education in the Health Professions*. 2017;**37**:245-254.

[6]   Department of Health. Remediation Report: Report of the Steering Group on Remediation. 2009. https://www.aomrc.org.uk/wp-content/uploads/2016/04/Remediation_report_0310.pdf. [Accessed 4th June 2019]

[7]   Price T, Archer J. UK Policy on Doctor Remediation: Trajectories and Challenges. *Journal of Continuing Education in the Health Professions*. 2017;**37**:207-211.

[8]   Swanwick T. *Understanding Medical Education: Evidence, Theory and Practice*. Second ed John Wiley & Sons; 2013.

[9]   Hauer KE, Ciccone A, Henzel TR, et al. Remediation of the deficiencies of physicians across the continuum from medical school to practice: a thematic review of the literature. *Academic medicine : journal of the Association of American Medical Colleges*. 2009;**84**:1822-1832.

[10]   Personal Social Services Research Unit. Unit Costs of Health and Social Care. In: Curtis L, ed. Personal Social Services Research Unit (PSSRU), 2012.

[11]   Price T, Brennan N, Cleland J, et al. Remediating doctors' performance to restore patient safety: a realist review protocol. *BMJ Open*. 2018;**8**.

[12]   Bourgeois-Law G, Teunissen PW, Regehr G. Remediation in practicing physicians: current and alternative conceptualizations. *Academic Medicine*. 2018;**93**:1638-1644.

[13]   Bourgeois-Law G, Varpio L, Regehr G, Teunissen PW. Education or regulation? Exploring our underlying conceptualisations of remediation for practising physicians. *Medical education*. 2019;**53**:276-284.

[14]   Cleland J, Leggett H, Sandars J, Costa MJ, Patel R, Moffat M. The remediation challenge: theoretical and methodological insights from a systematic review. *Medical Education*. 2013;**47**:242-251.

[15]   Ziring D, Danoff D, Grosseman S, et al. How Do Medical Schools Identify and Remediate Professionalism Lapses in Medical Students? A Study of U.S. and Canadian Medical Schools. *Academic medicine : journal of the Association of American Medical Colleges*. 2015;**90**:913-920.

[16]   Bebeau MJ, Faber-Langendoen K. Remediating lapses in professionalism. In: Kalet A, Chou CL, eds. *Remediation in medical education*. Springer, 2014; 103-127.

[17]   Byyny RL, Papadakis MA, Paauw DS. *Medical professionalism: best practices* Alpha Omega Alpha Honor Medical Society; 2015.

[18]   Wilkinson TJ, Wade WB, Knock LD. A blueprint to assess professionalism: results of a systematic review. *Academic Medicine*. 2009;**84**:551-558.

[19]   General Medical Council. Good medical practice. 2014. https://www.gmc-uk.org/-/media/documents/good-medical-practice---english-1215_pdf-51527435.pdf. [Accessed 4th June 2016]

[20]   Conran RM, Powell SZ-E, Domen RE, et al. Development of professionalism in graduate medical education: A case-based educational approach from the college of american pathologists' graduate medical education committee. *Academic pathology*. 2018;**5**:2374289518773493.

[21]   Cruess SR, Johnston S, Cruess RL. " Profession": a working definition for medical educators. *Teaching and learning in medicine*. 2004;**16**:74-76.

[22]   Brokaw JJ, Torbeck LJ, Bell MA, Deal DW. Impact of a competency-based curriculum on medical student advancement: A ten-year analysis. *Teaching and Learning in Medicine*. 2011;**23**:207-214.

[23]   Findyartini A, Sudarsono NC. Remediating lapses in professionalism among undergraduate pre-clinical medical students in an Asian Institution: a multimodal approach. *BMC Medical Education*. 2018;**18**:88.

[24]   Papadakis A, Paauw S, Hafferty W, Shapiro J, Byyny L. Perspective: The education community must develop best practices informed by evidence- based research to remediate lapses of professionalism. *Academic Medicine*. 2012;**87**:1694.

[25]   Bodenberg MM, Koehler JM. Customizing student learning during Advanced Pharmacy Practice Experiences. *Currents in Pharmacy Teaching and Learning*. 2015;**7**:519-525.

[26]   Dyrbye LN, Harper W, Moutier C, et al. A multi-institutional study exploring the impact of positive mental health on medical students' professionalism in an era of high burnout. *Academic Medicine*. 2012;**87**:1024-1031.

[27]   Centre for Reviews and Dissemination. Systematic reviews: CRD's guidance for undertaking reviews in healthcare. University of York, UK, 2016.

[28]   CASP. CASP Checklists. 2018. https://casp-uk.net/casp-tools-checklists/. [Accessed 27th July 2018]

[29]   Lacasse M, Audetat M-C, Boileau E, et al. BEME Review Protocol: Remediation interventions for undergraduate and postgraduate medical learners with academic difficulties: a BEME systematic review 2017. https://bemecollaboration.org/Reviews+In+Progress/Remediation+interventions/. [Accessed 4th June 2019]

[30]   Michie S, Wood CE, Johnston M, Abraham C, Francis J, Hardeman W. Behaviour change techniques: the development and evaluation of a taxonomic method for

reporting and describing behaviour change interventions (a suite of five studies involving consensus methods, randomised controlled trials and analysis of qualitative data). *Health Technology Assessment*. 2015;**19**.

[31]   Price T, Baines R, Marshall M, Cameron N, Bryce M, Archer J. Learning from significant medical events: a systematic review. *European Journal of Person Centred Healthcare*. 2018.

[32]   Barr H, Freeth D, Hammick M, Koppel I, Reeves S. Evaluations of interprofessional education: a United Kingdom review for health and social care. 2000.

[33]   Critical Appraisal Skills Programme. Critical Appraisal Skills Programme (CASP). 2016. http://www.casp-uk.net. [Accessed 16/06/16 2016]

[34]   Popay J, Roberts H, Sowden A, et al. Guidance on the Conduct of Narrative Synthesis in Systematic Reviews. 2006. https://www.lancaster.ac.uk/shm/research/nssr/research/dissemination/publications/NS_Synthesis_Guidance_v1.pdf. [Accessed 5th June 2019]

[35]   Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ*. 2009;**339**.

[36]   Broadfoot KJ, Guerrasio J, Aagaard EM. Beyond procedures and checklists: using simulation to remediate communication and professionalism skill challenges. *SGIM Forum*. 2015;**38**:2.

[37]   Grant WD. An individualized educational model for the remediation of physicians. *Archives of family medicine*. 1995;**4**:767-772; discussion 773.

[38]   Wu JS, Siewert B, Boiselle PM. Resident evaluation and remediation: a comprehensive approach. *Journal of graduate medical education*. 2010;**2**:242-245.

[39]   Cosman BC, Alverson AD, Boal PA, Owens EL, Norcross WA. Assessment and remedial clinical education of surgeons in California. *Archives of Surgery*. 2011;**146**:1411-1415.

[40]   Spickard A, Swiggart WH, Manley G, Dodd D. A continuing education course for physicians who cross sexual boundaries. *Sexual Addiction &Compulsivity: The Journal of Treatment and Prevention*. 2002;**9**:33-42.

[41]   Spickard WA, Swiggart WH, Manley GT, Samenow CP, Dodd DT. A continuing medical education approach to improve sexual boundaries of physicians. *Bulletin of the Menninger Clinic*. 2008;**72**:38-53.

[42]   Parran TV, Pisman AR, Youngner SJ, Levine SB. Evolution of a Remedial CME Course in Professionalism: Addressing Learner Needs, Developing Content, and Evaluating Outcomes. *Journal of Continuing Education in the Health Professions*. 2013;**33**:174-179.

[43]   Swiggart W, Dewey C, Ghulyan M, Spickard A. Spanning a Decade of Physician Boundary Violations: Are We Improving? *HEC forum : an interdisciplinary journal on hospitals' ethical and legal issues*. 2016;**28**:129-140.

[44]   Samenow CP, Swiggart W, Spickard Jr A. A CME course aimed at addressing disruptive physician behavior. *Physician executive*. 2008;**34**:32.

[45]   Guevara M, Grewald Y, Hutchinson K, Amoateng-Adjepong Y, Manthous C. Individualized education plans in medical education. *Connecticut medicine*. 2014;**75**:537-540.

[46]   Bierer SB, Dannefer EF, Tetzlaff JE. Time to Loosen the Apron Strings: Cohort-based Evaluation of a Learner-driven Remediation Model at One Medical School. *Journal of General Internal Medicine*. 2015;**30**:1339-1343.

[47]   Mar C, Chang S, Forster B. Remedial Training for the Radiology Resident: A Template for Optimization of the Learning Plan. *Academic Radiology*. 2015;**22**:240-246.

[48]   Guerrasio J, Garrity MJ, Aagaard EM. Learner deficits and academic outcomes of medical students, residents, fellows, and attending physicians referred to a remediation program, 2006-2012. *Academic Medicine*. 2014;**89**:352-358.

[49]   Egener B. Addressing physicians' impaired communication skills. *Journal of general internal medicine*. 2008;**23**:1890.

[50]   Murad MH, Asi N, Alsawas M, Alahdab F. New evidence pyramid. *BMJ Evidence-Based Medicine*. 2016;**21**:125-127.

[51]   Papadakis MA, Teherani A, Banach MA, et al. Disciplinary action by medical boards and prior behavior in medical school. *New England Journal of Medicine*. 2005;**353**:2673-2682.

[52]   Prescott-Clements L, Voller V, Bell M, Nestors N, van der Vleuten CPM. Rethinking Remediation: A Model to Support the Detailed Diagnosis of Clinicians' Performance Problems and the Development of Effective Remediation Plans. *Journal of Continuing Education in the Health Professions*. 2017;**37**:245-254.

[53]   Miller A, Archer J. Impact of workplace based assessment on doctors' education and performance: a systematic review. *Bmj*. 2010;**341**:c5064.

[54]   Lockyer J. Multisource feedback in the assessment of physician competencies. *Journal of Continuing education in the Health Professions*. 2003;**23**:4-12.

[55]   Riveros R, Kimatian S, Castro P, et al. Multisource feedback in professionalism for anesthesia residents. *Journal of clinical anesthesia*. 2016;**34**:32-40.

[56]   Pawson R, Greenhalgh T, Harvey G, Walshe K. Realist review - a new method of systematic review designed for complex policy interventions. *Journal of Health Services Research & Policy*. 2005;**10**:21-34.