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## SECURING THE EVIDENCE AND THEORY-BASED DESIGN OF AN ONLINE INTERVENTION DESIGNED TO SUPPORT MIDWIVES IN WORK-RELATED PSYCHOLOGICAL DISTRESS

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### Abstract

The psychological wellbeing of midwives can be linked to the safety and quality of maternity care. As such, work-related psychological distress in midwifery populations must be addressed in order to meet the United Nation's Sustainable Development Goals for maternal health. Earlier research maps out a global vision, using telemedicine and e/mHealth for the design and development of an online intervention designed to support midwives in work-related psychological distress. This paper outlines how the evidence and theory-based design of such an intervention has been secured via a narrative review, a critical realist review, a 2-round Delphi study and a mixed-methods systematic review of the literature. Findings suggest that this online intervention should be designed to provide anonymity and confidentiality for midwives seeking support online. 24-hour mobile access, effective moderation, an online discussion forum, and additional legal, educational, and therapeutic components are also indicated for collation in a 'One stop shop' online. Additionally, a simple user assessment may be used to identify those people deemed to be at risk of causing harm. The comprehensive design for this particular intervention is outlined using a validated checklist and guide. This particular design has been informed by the pathways disclosure model and the revised transactional model of occupational stress and coping. This research has been guided by the Medical Research Council's framework for developing complex interventions. Future research in this field is also suggested. Should this intervention be developed and tested more widely, both midwives and maternity service users may experience safer, more productive and higher-quality maternity care.

**Keywords:** midwifery; complex interventions; mHealth; eHealth; work-related stress

### Introduction

The healthcare sector has one of the highest estimated prevalence rates of work-related stress.<sup>1</sup> This is significant because there are serious consequences for the healthcare services, which are associated with poor health and wellbeing in healthcare staff. For example, staff sickness absence rates can cost an estimated £3.3million annually per healthcare organisation.<sup>2</sup> Additionally, when staff are absent, there is the added £3.3billion annual cost of agency staff.<sup>3</sup>

Moreover, there are serious consequences associated with work-related psychological distress for frontline healthcare staff, where over 30% of all sick leave can be caused by work-place stress.<sup>4</sup> Significantly, where frontline healthcare staff are psychologically distressed, the quality of patient experiences and clinical outcomes are reduced, and standardised mortality and infection rates are higher.<sup>5-9</sup> Furthermore, in recent years Litigation authorities have paid out over £1.1 billion following medical errors,<sup>10</sup> which occur more frequently when healthcare staff experience work-related psychological distress.<sup>9</sup> Therefore, work-related psychological distress in midwifery populations must be addressed in pursuit of meeting the United Nation's Sustainable Development Goals for maternal health.

A recent review commissioned by the government in the United Kingdom calls for the development of online wellbeing portals for staff, using e-health, telemedicine or information and communication technologies (ICT) for health.<sup>11</sup> Yet, whilst previous reviews have reported on a number of interventions designed to support healthcare workers experiencing work-related psychological distress, very few have been delivered online.<sup>12-16</sup> Reviews also call for new evidence and research on standardised, theory driven, flexible and accessible interventions for healthcare professionals.<sup>12-16</sup> This paper outlines the process of securing the evidence and theory-based design of an online intervention designed to support midwives in

work-related psychological distress. This process has been guided by the Medical Research Council's (MRC) guidelines for the development of complex interventions.<sup>17</sup>

Midwives have been chosen as an exemplary sample of healthcare professionals in this case, because a recent review of maternity services has highlighted how midwifery staff are more likely to report work-related stress than other staff groups.<sup>18</sup> There are also other reasons why midwives are a particularly appropriate group to focus upon. As well as the problems associated with a lack of staffing resources, estimates suggest that enabling a midwife to return-to-practice can cost £2,000 per midwife, and training a new member of staff can cost around £79,000.<sup>19</sup> Furthermore, recruitment costs to replace each staff member who leaves owing to work-related stress is estimated to be £4,500.<sup>20</sup> Therefore, where the midwifery workforce is adequately supported, healthcare services may also see significant cost savings.<sup>21</sup> Whilst these figures are focused upon the English maternity services, the deployment of an online support intervention could reach the international midwifery community for the benefit of both the midwifery profession, and mothers and babies around the world.

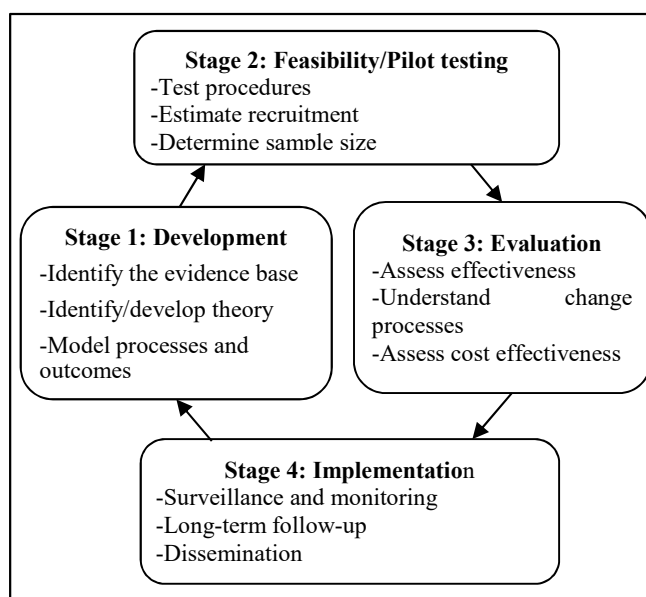
One review reports how the global midwifery community can experience both occupational and organisational sources of work-related psychological distress.<sup>22</sup> In a more recent study carried out by the Royal College of Midwives, 48% of midwives felt stressed every day, or most days, with half of respondents worried about making a mistake.<sup>23</sup> Additionally, nearly two-thirds (64%) also said they felt unwell because of work-related stress. Yet encouragingly, these levels of psychological distress were reduced when positive actions were taken. Therefore, should theory driven, and evidence-based support interventions be developed and tested for midwives, several encouraging outcomes for maternity services could be realised. Additionally, both human and financial cost savings for global maternity services could be realised via better retention, recruitment and sickness absence rates, and fewer medical errors.

The purpose of this paper is to outline how the evidence and theory-based design of an online intervention designed to support midwives in work-related psychological distress has been secured via a series of research processes. This paper also summarises the content and design of this intervention to demonstrate how each component has been

considered in response to the evidence and theory presented.

## Methods

This research sits within the first stage of the MRC's framework for developing complex interventions.<sup>17</sup> As such, several studies have been undertaken to identify existing evidence, identify appropriate theory and model the processes and outcomes of this intervention in order to inform its evidence and theory-based design. The complete cycle of the MRC's framework is detailed in figure 1.



**Figure 1.** MRC framework for developing complex interventions.

The first part of this work involved the identification of preliminary evidence for the design of an online intervention designed to support midwives in work-related psychological distress. Here, the literature was reviewed and published narratively in order to gain a broader perspective with regard to the contemporary aetiology, experiences, symptomology and epidemiology of midwives in psychological distress.<sup>22</sup> Fourteen separate broad search strategies retrieved 264 studies after 98 duplicates were removed, leaving 166 papers to review. Final papers selected for inclusion were limited to cohort studies, systematic reviews, meta-analyses, and randomised controlled trials.

Subsequently, in order to explore the ethical considerations in offering midwives the provision of anonymous and confidential online support, a critical

realist review of the literature was conducted and published.<sup>24</sup> Here, an iterative search strategy was used to select nine papers for review. Papers were examined for ideas in relation to the ethical dimensions of online interventions to support midwives in work-related psychological distress. These ethical dimensions were associated with the provision of confidentiality, anonymity and the result of these two primary dimensions, amnesty. The results of both this study and the preceding narrative review led the process of conducting a further brief review of the literature, which identified the relevant theories associated with the design of this intervention. Then, elements of all of the studies included in this work were informed by a theory of occupational stress and coping.

Next, 185 international experts were invited to participate in a 2-round Delphi study, designed to achieve expert consensus for priorities in the development of an online intervention to support midwives in work-related psychological distress. This study has been published elsewhere.<sup>25</sup> Overall, 39 questions were posed to eligible participants over 2 rounds. Consensus of opinion was defined as a minimum of 60% of panellists responding within two adjacent points on the 7-point rating scale. This scale was anchored at “Not a priority” and “Essential priority”. Statements that did not achieve consensus in Round 1 were returned to participants in Round 2. Following each round, panellists were also invited to reflect upon an overall report, detailing all participant responses. Open text responses were coded and then assigned to emergent themes in a succession of refinements. Quantitative results were presented via tabulated statistics. The full protocol for this study has been published elsewhere.<sup>26</sup>

In order to establish what type of support was already available to and effective for midwives in work-related psychological distress, a mixed-methods systematic review was subsequently conducted. Here, six databases were used to conduct six detailed searches. Terms relating to the identification of the midwifery profession, terms available which broadly related to any of the outcomes that were considered to be generally associated with ‘work-related psychological distress’ and terms relating to work, employment, occupation and professional health were used in conjunction with terms associated with the management of general wellbeing, interventions, treatments, therapies and coping behaviours.

To be eligible for inclusion, studies had to identify at least one intervention and report on at least one outcome measure. Following a process of review, six contemporary studies were selected for inclusion. The quality of studies was appraised using a scoring system designed for appraising mixed-methods research, and concomitantly appraising qualitative, quantitative and mixed-methods primary studies in mixed reviews. Bias was assessed using an assessment of methodological rigor tool. Overall, this study took a segregated systematic mixed-methods review approach.<sup>27</sup> The methods used for this study have been published elsewhere.<sup>28</sup>

## Results

The first narrative review conducted yielded 30 international studies relating to the phenomenon of midwives and student midwives in work-related psychological distress. Findings revealed that midwives experience both organisational and occupational sources of work-related stress. This stress is met with inadequate support provision and is not conducive to high-quality maternity care. Furthermore, midwives in some cases were either unable to identify ill health in themselves or were reluctant to seek help due to shame and stigma. The full results of this research have been published elsewhere.<sup>22</sup>

The critical realist review that explored the ethical considerations in relation to offering midwives the provision of confidentiality and anonymity online reported that whilst online interventions can support the development of insight, help seeking and open discussion, ethical dilemmas remain where users cannot be identified. Additionally, this review demonstrated that internet support groups can become morally persuasive in nature. As anonymity and confidentiality were found to be both effective and therapeutic features of online interventions when used in collaboration with effective online moderation, this review advocated for their use in help seeking midwifery populations. This critical realist review has been published elsewhere.<sup>24</sup>

As a result of these initial findings, two theories were then identified as appropriate for guiding the design of an online intervention intended to support midwives in work-related psychological distress. Firstly, the pathways disclosure model was identified as one way of demonstrating how an online user seeking help both anonymously and confidentially can progress

to a full face-to-face disclosure of events for the purpose of help seeking. This model is outlined in figure 2.



Figure 2. The Pathways Disclosure Model.

Secondly, a theoretical, process-orientated model which combines both Lazarus' transactional theory of stress and coping<sup>29</sup> and Karasek's JDC theory<sup>30</sup> was chosen to provide the most appropriate underpinning for the design and development of this online intervention. Displayed in figure 3, this model is outlined as the revised transactional model of occupational stress and coping presented by Goh and colleagues.<sup>31,32</sup>

There is currently a known gap between stress-specific theories and their application in the design and development of online interventions designed to support those in work-related psychological distress.<sup>33</sup> As such, the application of these two theories may further strengthen the design of the online intervention presented here. Yet it is also important to apply evidence from other interventions designed to support midwives and evidence from experts in the field.

Results from the mixed-methods systematic review conducted revealed that mindfulness interventions, work-based resilience workshops partnered with a mentoring programme and the provision of clinical supervision provide a variety of both personal and professional positive outcomes and experiences for midwives. However, some participants were unable to participate in the interventions as provided for practical reasons. None of these interventions were delivered online. In this context, only mindfulness-based interventions were considered to be wholly transferable to being delivered online anonymously and confidentially. As such, the design of a comprehensive online intervention of this type can be considered to be entirely novel. Moreover, the studies identified within this review were not considered to be of high-quality. Therefore, new opportunities are now presented for the design of new online interventions of this type to be rigorously developed and tested in line with the MRC framework for developing complex interventions.<sup>17</sup> This mixed-methods systematic review has been published elsewhere.<sup>28</sup>

When experts were invited to identify the priorities

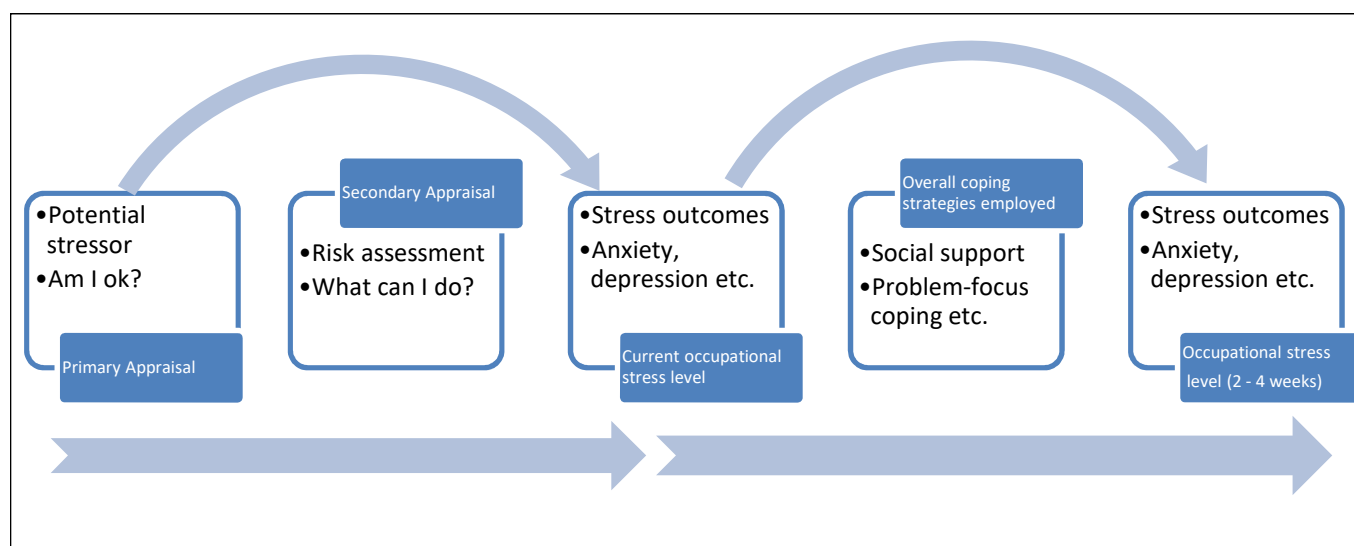


Figure 3. The Revised Transactional Model of Occupational Stress and Coping.



in designing and developing an online intervention to support midwives in work-related psychological distress, participants agreed that future designs should make confidentiality and anonymity a high priority, along with 24-hour mobile access, effective moderation, an online discussion forum, and additional legal, educational, and therapeutic components. Experts also decided that midwives should be offered a simple user assessment to identify those people deemed to be at risk of either causing harm to others or experiencing harm themselves. It was agreed that those at risk should then be directed to access external support. With this evidence secured, findings were integrated into the development process to fully optimise intervention design. This Delphi study has been published elsewhere.<sup>25</sup>

Along with the findings presented within these individual studies, the design of this online intervention to support midwives has also been inspired by the components of other online interventions, also rooted within transactional models of stress.<sup>34–39</sup> In order to comprehensively describe the overall proposed design for this online intervention to support midwives, the Template for Intervention Description and Replication (TIDieR) checklist and guide has been employed.<sup>40</sup> This checklist and guide is presented in Appendix A. It has been completed alongside the supporting evidence for each component. This table also reports how each item relates to relevant theory.

## Discussion

The primary narrative review of the literature outlined the sources, nature and prevalence of work-related psychological distress in global midwifery populations. Findings showed that midwives from around the world can experience both organisational and occupational sources of distress.

The critical review of the literature identified and explored the ethical considerations in relation to providing midwives in distress with confidential and anonymous online support. This review concluded that the principles of confidentiality, anonymity and amnesty should be upheld in the pursuit of the greatest benefit for the greatest number of people.

The systematic mixed-methods review presented here found that no evidence-based online interventions for midwives in work-related psychological distress are currently available. Some participants within studies

were also unable to fully engage with targeted interventions face-to-face. However, all of the studies collated within this review reported both personal and professional benefits for midwives who engaged in mindfulness sessions, work-based resilience workshops partnered with a mentoring programme and clinical supervision.

The 2-round Delphi study presented here concluded that the design of an online intervention to support midwives in work-related psychological distress should most highly prioritise confidentiality and anonymity. These particular findings reflect the conclusions of other research, where doctors also report that their engagement depended upon the promise and certainty of confidentiality.<sup>54</sup> In this case, participants purported that there would be a need for effective moderation within an online discussion forum, along with 24-hour mobile access. In order to direct those in need towards appropriate support, these experts also indicated that midwives should also be offered a simple user assessment to identify risks of either causing harm to others or experiencing harm themselves. Practically, the inclusion of legal, educational, and therapeutic components was suggested to finalise the design of this intervention.

Overall, the findings from a narrative review,<sup>22</sup> a critical realist review,<sup>24</sup> a mixed-methods systematic review<sup>28</sup> and a 2-round Delphi study<sup>25</sup> have given evidence for the design and development of an online intervention to support midwives as outlined in Appendix A. The design of this online intervention has also been informed by the revised transactional model of stress and coping and the pathways disclosure model.<sup>31,32</sup> In applying process orientated theories as a ‘theoretical lens’, a better understanding of stress has been able to guide this research throughout.<sup>55</sup>

Whilst this research is situated within the first stage of the MRC framework for developing complex interventions,<sup>56</sup> there are still some unanswered research questions to address prior to embarking upon feasibility testing. For example, some experts remained wary of affording confidentiality and anonymity to midwives online, given that this would essentially afford them amnesty should they disclose episodes of impairment such as misconduct.<sup>25</sup> Therefore, further patient and public involvement (PPI) activities may be needed to decide what level of confidentiality and/or anonymity may be acceptable in this context. It will also be important to ascertain how midwives may optimise

the development of this intervention for use. As such, further development studies which include the potential end users of this intervention may also be required.

Since the research presented within this paper has been completed, an evaluation of a web-based holistic stress reduction pilot program among nurse-midwives has been published.<sup>57</sup> This intervention used yoga, meditation, and Mindfulness Based Stress Reduction (MBSR) techniques on an alternating basis, over a 4-week period to help reduce perceived barriers to self-care activities. It was rooted within Watson's theory of human caring.<sup>58</sup> Results from this study showed a potential for an improvement in stress levels and coping abilities after participation. However, this online intervention was not designed to achieve the goals of the elements essential to the intervention designed here.

This paper has outlined a research process which has led to the evidence and theory-based design of an online intervention designed to support midwives in work-related psychological distress. This paper also maps the content and design of this online intervention to the evidence and theories presented. Recent reviews call for the development of evidence based online support for staff at work,<sup>11</sup> support for the health and wellbeing of frontline healthcare staff<sup>59</sup> and more flexible types of evidence and theory based interventions.<sup>60</sup> As such, there is an opportunity to build upon this early foundation of evidence and progress to stage 2 of the MRC framework for developing and evaluating complex interventions.<sup>56</sup> Such future research would include a development and feasibility study for the purpose of designing an adequately powered controlled trial with a randomised cluster and internal pilot design. Should the use of this online intervention prove effective, then international midwifery communities may experience a psychologically safer professional journey, and maternity service users may experience safer, more productive and higher-quality maternity care in line with the United Nation's Sustainable Development Goals for maternal health.

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## References

1. Health and Safety Executive. Stress and Psychological Disorders in Great Britain. (2016). Available at: <http://www.hse.gov.uk/statistics/causdis/stress/stress.pdf> accessed 28 September 2017.
2. Buchan J, Seccombe I, Charlesworth A. Staffing matters; funding counts. Workforce profile and trends in the English NHS. The Health Foundation 2016. (2016). Available at: <https://www.health.org.uk/publication/staffing-matters-funding-counts> accessed 10 April 2018.
3. Newman B. Government action on agency use cuts NHS staffing bill. *Nurse Manag* 2016;22(9):7-7.
4. NHS Employers. Reducing sickness absence in the NHS using evidence-based strategies. Summary report. (2014). Available at: <http://www.nhsemployers.org/~media/Employers/Publications/Reducing%20sickness%20absence%20in%20the%20NHS.pdf> accessed 10 April 2018.
5. Darzi A. High quality care for all: NHS next stage review final report. London: Department of Health. (2008). Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/228836/7432.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/228836/7432.pdf) accessed 10 April 2018.
6. West M, Dawson J. Employee engagement and NHS performance. The Kings Fund. (2012). Available at: <https://www.kingsfund.org.uk/sites/default/files/employee-engagement-nhs-performance-west-dawson-leadership-review2012-paper.pdf> accessed 10 April 2018.
7. Boorman S. The Final Report of the independent NHS Health and Well-being review. Department of Health. NHS health and well-being review—the government response. (2009). Available at: [http://webarchive.nationalarchives.gov.uk/20130124052412/http://www.dh.gov.uk/prod\\_consum\\_d](http://webarchive.nationalarchives.gov.uk/20130124052412/http://www.dh.gov.uk/prod_consum_d)

- [h/groups/dh\\_digitalassets/documents/digitalasset/dh\\_108907.pdf](https://groups.dh.digitalassets/documents/digitalasset/dh_108907.pdf) accessed 10 April 2018.
8. The Royal College of Physicians. Work and wellbeing in the NHS: why staff health matters to patient care. (2015). Available at: <https://www.rcpsych.ac.uk/pdf/RCP-%20WorkWellbeingNHS.pdf> accessed 10 April 2018.
  9. Hall LH, Johnson J, Watt I, Tsipa A, O'Connor DB. Healthcare staff wellbeing, burnout, and patient safety: a systematic review. *PLoS One* 2016;11(7):e0159015.
  10. Symon A. Summer reading: The NHS Litigation Authority Annual Report. *Br J Midwifery* 2016;24(9):669-670.
  11. The Lancet. Improving mental health in the workplace. *Lancet* 2017;390(10107):2015.
  12. Guillaumie L, Boiral O, Champagne J. A mixed-methods systematic review of the effects of mindfulness on nurses. *J Adv Nurs* 2016;73(5):1017-1034.
  13. Regehr C, Glancy D, Pitts A, LeBlanc VR. Interventions to reduce the consequences of stress in physicians: a review and meta-analysis. *J Nerv Ment Dis* 2014;202(5):353-359.
  14. Murray M, Murray L, Donnelly M. Systematic review of interventions to improve the psychological well-being of general practitioners. *BMC Fam Pract* 2016;17(1):36.
  15. Romppanen J, Häggman-Laitila A. Interventions for nurses' well-being at work: a quantitative systematic review. *J Adv Nurs* 2016;73(7):1555-1569.
  16. Ruotsalainen JH, Verbeek JH, Mariné A, Serra C. Preventing occupational stress in healthcare workers. The Cochrane Library. (2015). Available at: [http://www.cochrane.org/CD002892/OCHEALTH\\_preventing-occupational-stress-in-healthcare-workers](http://www.cochrane.org/CD002892/OCHEALTH_preventing-occupational-stress-in-healthcare-workers) accessed 10 April 2018.
  17. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ* 2008;29;337:a1655.
  18. Cumberlege J. Better births. Improving outcomes of maternity services in England: A Five Year Forward View for maternity care. The National Maternity Review. London: NHS England; 2016. Available at: <https://www.england.nhs.uk/wp-content/uploads/2016/02/national-maternity-review-report.pdf> accessed 10 April 2018.
  19. Department of Health. Managing the supply of NHS clinical staff in England. (2016). Available at: <https://www.nao.org.uk/wp-content/uploads/2016/02/Managing-the-supply-of-NHS-clinical-staff-in-England.pdf> accessed 10 April 2018.
  20. Lewis R, Donaldson-Feilder E, Tharani T. Managing for sustainable employee engagement: Developing a behavioural framework. CIPD. (2012). Available at: <http://www.mas.org.uk/uploads/artlib/managing-for-sustainable-employee-engagement.pdf> accessed 10 April 2018.
  21. Edwards N, Gilbert A, Mander R, et al. Are staffing shortages changing the culture of midwifery? *Pract Midwife* 2016;19(3):12-14.
  22. Pezaro S, Clyne W, Turner A, Fulton EA, Gerada C. 'Midwives Overboard!' Inside their hearts are breaking, their makeup may be flaking but their smile still stays on. *Women Birth* 2015;29(3):59-66.
  23. The Royal College of Midwives. Caring for You Campaign: Survey Results RCM campaign for healthy workplaces delivering high quality care. RCM. (2017) Available at: <https://www.rcm.org.uk/sites/default/files/Caring%20for%20You%20-%20Survey%20Results%202016%20A5%2084p%205%20spd.pdf> accessed 10 April 2018.
  24. Pezaro S, Clyne W, Gerada C. Confidentiality, anonymity and amnesty for midwives in distress seeking online support - Ethical? *Nurs Ethics* 2016;pii: 0969733016654315. [Epub ahead of print].
  25. Pezaro S, Clyne W. Achieving consensus for the design and delivery of an online intervention to support midwives in work-related psychological distress: results from a Delphi Study. *JMIR Mental Health* 2016;3(3):e32.
  26. Pezaro S, Clyne W. Achieving consensus in the development of an online intervention designed to effectively support midwives in work-related psychological distress: protocol for a Delphi Study. *JMIR Res Protoc* 2015;4(3):e107.
  27. Sandelowski M, Voils CI, Barroso J. Defining and designing mixed research synthesis studies. *Res Sch* 2006;13(1):29.



28. Pezaro S, Clyne W, Fulton EA. A systematic mixed-methods review of interventions, outcomes and experiences for midwives and student midwives in work-related psychological distress. *Midwifery* 2017;50:163-173.
29. Cooper G. Exploring and understanding online assistance for problem gamblers: The pathways disclosure model. *Int J Ment Health Addict* 2004;1(2):32-38.
30. Lazarus RS, Folkman S. *Stress, Appraisal, and Coping*. New York. Springer 1986.
31. Karasek Jr RA. Job demands, job decision latitude, and mental strain: Implications for job redesign. *Adm Sci Q* 1979;24(2):285-308.
32. Goh YW, Sawang S, Oei TP. The Revised Transactional Model (RTM) of occupational stress and coping: An improved process approach. *Austral J Org Psych* 2010;3:13-20.
33. Ryan C, Bergin M, Chalder T, et al. Web-Based interventions for the management of stress in the workplace: focus, form, and efficacy. *J Occup Health* 2017;59(3):215-236.
34. Ebert DD, Heber E, Berking M, et al. Self-guided internet-based and mobile-based stress management for employees: results of a randomised controlled trial. *Occup Environ Med* 2016;73(5):315-323.
35. Ebert DD, Lehr D, Heber E, et al. Internet- and mobile-based stress management for employees with adherence-focused guidance: efficacy and mechanism of change. *Scand J Work Environ Health* 2016;42(5):382-394.
36. Heber E, Lehr D, Ebert DD, et al. Web-Based and Mobile Stress Management Intervention for Employees: A Randomized Controlled Trial. *J Med Internet Res* 2016;18(1):e21.
37. Williams A, Hagerty BM, Brasington SJ, et al. Stress gym: Feasibility of deploying a web-enhanced behavioral self-management program for stress in a military setting. *Mil Med* 2010;175(7):487-493.
38. Stansfeld SA, Kerry S, Chandola T, et al. Pilot study of a cluster randomised trial of a guided e-learning health promotion intervention for managers based on management standards for the improvement of employee well-being and reduction of sickness absence: GEM Study. *BMJ Open* 2015;5(10):e007981,2015-007981.
39. Ebert DD, Berking M, Thiart H, et al. Restoring depleted resources: Efficacy and mechanisms of change of an internet-based unguided recovery training for better sleep and psychological detachment from work. *Health Psych* 2015;34(S):1240.
40. Hoffmann TC, Glasziou PP, Boutron I, et al. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ* 2014;348:g1687.
41. Foureur M, Besley K, Burton G, Yu N, Crisp J. Enhancing the resilience of nurses and midwives: Pilot of a mindfulness based program for increased health, sense of coherence and decreased depression, anxiety and stress. *Contemp Nurse* 2013;45(1):114-125.
42. Warriner S, Hunter L, Dymond M. Mindfulness in maternity: Evaluation of a course for midwives. *Br J Midwifery* 2016;24(3):188-195.
43. van der Riet P, Rossiter R, Kirby D, Dluzewska T, Harmon C. Piloting a stress management and mindfulness program for undergraduate nursing students: Student feedback and lessons learned. *Nurse Educ Today* 2015;35(1):44-49.
44. Huang H. Examining the beneficial effects of individual's self-disclosure on the social network site. *Comput Human Behav* 2016;57:122-132.
45. Li S, Feng B, Li N, Tan X. How social context cues in online support-seeking influence self-disclosure in support provision. *Commun Q* 2015;63(5):586-602.
46. Oh HJ, Ozkaya E, LaRose R. How does online social networking enhance life satisfaction? The relationships among online supportive interaction, affect, perceived social support, sense of community, and life satisfaction. *Comput Human Behav* 2014;30:69-78.
47. Lehr D, Geraedts A, Asplund RP, et al. Occupational e-Mental Health: Current Approaches and Promising Perspectives for Promoting Mental Health in Workers. In: *Healthy at Work*. Springer; 2016:257-281.
48. Cheng S, Tsui PK, Lam JH. Improving mental health in health care practitioners: Randomized controlled trial of a gratitude intervention. *J Consult Clin Psychol* 2015;83(1):177.
49. Billings DW, Cook RF, Hendrickson A, Dove DC. A web-based approach to managing stress and mood disorders in the workforce. *J Occup Environ Med* 2008;50(8):960-968.
50. Feicht T, Wittmann M, Jose G, et al. Evaluation of a seven-week web-based happiness training to

- improve psychological well-being, reduce stress, and enhance mindfulness and flourishing: a randomized controlled occupational health study. *Evid Based Complementary Altern Med* 2013;2013:676953.
51. McDonald G, Jackson D, Wilkes L, Vickers MH. Personal resilience in nurses and midwives: Effects of a work-based educational intervention. *Contemp Nurse* 2013;45(1):134-143.
  52. McDonald G, Jackson D, Wilkes L, Vickers MH. A work-based educational intervention to support the development of personal resilience in nurses and midwives. *Nurse Educ Today* 2012;32(4):378-384.
  53. Wallbank S. Effectiveness of individual clinical supervision for midwives and doctors in stress reduction: findings from a pilot study. *Evid Based Midwifery* 2010;8(2):65-70.
  54. Bianchi EF, Bhattacharyya MR, Meakin R. Exploring senior doctors' beliefs and attitudes regarding mental illness within the medical profession: a qualitative study. *BMJ Open* 2016;6(9):e012598,2016-012598.
  55. Lazarus RS. *Stress and emotion: A new synthesis*. Springer Publishing Company; 2006.
  56. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ* 2008;337:a1655.
  57. Wright EM. Evaluation of a web-based holistic stress reduction pilot program among nurse-midwives. *J Holist Nurs* 2017;0898010117704325 [Epub ahead of print].
  58. Watson J. The theory of human caring: retrospective and prospective. *Nurs Sci Q* 1997;10(1):49-52.
  59. England N. NHS five year forward view. London: NHS England. (2014). Available at: <https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf> accessed 10 April 2018.
  60. Burton A, Burgess C, Dean S, Koutsopoulou GZ, Hugh-Jones S. How effective are mindfulness-based interventions for reducing stress among healthcare professionals? A systematic review and meta-analysis. *Stress Health* 2016;33(1):3-13.

**Appendix A.** Design of a proposed online intervention to support midwives in work-related psychological distress.

<b>TIDieR item</b>	<b>Item</b>	<b>Evidence</b>	<b>Related theory base</b>
Why: Goal of the elements essential to the intervention	For Midwives: -Identify work-related psychological distress -Manage work-related psychological distress -Reduce work-related psychological distress -Cope following episodes of work-related psychological distress	-Delphi study findings -Critical realist review findings -Systematic review results -Narrative review findings	The revised transactional model of occupational stress and coping: -Appraisal -Outcomes -Coping
What: Materials (Components)	The inclusion of Web-based videos, multimedia resources, and tutorials which explore topics around psychological distress	-Delphi study results	The revised transactional model of occupational stress and coping: -Appraisal -Outcomes -Coping
	The inclusion of informative multimedia designed to assist midwives to recognise the signs and symptoms of psychological distress	-Delphi study results	The revised transactional model of occupational stress and coping: -Appraisal -Outcomes -Coping
	The inclusion of multimedia resources which disseminate self-care techniques	-Delphi study results	The revised transactional model of occupational stress and coping: -Appraisal -Outcomes -Coping
	The inclusion of multimedia resources which disseminate relaxation techniques	-Delphi study results	The revised transactional model of occupational stress and coping: -Appraisal -Outcomes -Coping
	The inclusion of mindfulness tutorials and multimedia resources	-Delphi study results - Systematic review results _41-43	The revised transactional model of occupational stress and coping: -Appraisal -Outcomes -Coping
	The inclusion of Cognitive Behavioural Therapy (CBT) tutorials and multimedia resources	-Delphi study results	The revised transactional model of occupational stress and coping: -Appraisal -Outcomes -Coping
	The inclusion of information designed to inform midwives where	-Delphi study results -Critical realist review results	The revised transactional model of occupational stress and coping: -Appraisal

	they can access alternative help and support		-Coping
	The inclusion of information designed to inform midwives as to where they can access legal help and advice	-Delphi study results	The revised transactional model of occupational stress and coping: -Appraisal -Coping
	Web-based peer-to-peer discussion chat room	-Delphi study results <sup>44-46</sup> -Critical realist review results	The revised transactional model of occupational stress and coping: -Appraisal -Outcomes -Coping
	Self-management exercises and decision aids	<sup>47</sup> -Narrative review findings	-Components which have been incorporated in other online interventions, rooted within the transactional models of stress <sup>34-39</sup>  The revised transactional model of occupational stress and coping: -Appraisal -Coping -Outcomes
	Online self-monitoring wellbeing and gratitude diaries	<sup>48</sup> -Narrative review findings	
	Audio-narrated videos and graphics designed to promote goal setting, problem-solving and effective time management	<sup>49</sup> -Narrative review findings	
	Positive psychology exercises	<sup>50</sup> -Narrative review findings	
What: Procedures (delivery, features and functionalities)	Confidentiality for all users	-Delphi study results -Critical realist review results	The revised transactional model of occupational stress and coping: -Appraisal -Coping
	Anonymity for all users	-Delphi study results -Critical realist review results	The revised transactional model of occupational stress and coping: -Appraisal -Coping
	Prompting platform users automatically to seek help, by signposting them to appropriate support	-Delphi study results -Critical realist review results	The revised transactional model of occupational stress and coping: -Appraisal -Coping
	Mobile device compatibility	-Delphi study results	The revised transactional model of occupational stress and coping: -Coping
	Effective moderation	-Delphi study results -Critical realist review results	The revised transactional model of occupational stress and coping: -Appraisal -Coping
	24/7 availability	-Delphi study results -Critical realist review results	The revised transactional model of occupational stress and coping: -Coping



		-Systematic review results	
	The implementation of an initial simple user assessment using a psychological distress scale to prompt the user to access the most suitable support available	-Delphi study results -Critical realist review results	The revised transactional model of occupational stress and coping: -Appraisal -Coping -Outcomes
	The follow up and identification of those at risk	-Delphi study results -Critical realist review results	The revised transactional model of occupational stress and coping: -Appraisal -Coping -Outcomes
How	Online delivery	-Narrative review findings -Delphi study results -Critical realist review results -Systematic review results	The revised transactional model of occupational stress and coping: -Coping
Tailoring	Individual-focused	-Narrative review findings -Systematic review results - 41–43,51–53	Individual-focused online interventions, rooted within the transactional models of stress <sup>34–37,39</sup>  The revised transactional model of occupational stress and coping: -Coping -Appraisal -Outcomes
	A ‘One stop shop’	-Delphi study results	The revised transactional model of occupational stress and coping: -Coping -Appraisal -Outcomes