Received: 22 April 2021 | Accepted: 14 July 2021

DOI: 10.1111/aphw.12300

ORIGINAL ARTICLE

APPLIED PSYCHOLOGY: Health and Well-Being IAAP

Supporting doctors' well-being and resilience during COVID-19: A framework for rapid and rigorous intervention development

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Abstract

This paper aims to outline the development of a theoretically informed and evidence-based intervention strategy to underpin interventions to support the well-being of doctors during COVID-19 and beyond; delineate new ways of working were employed to ensure a rapid and rigorous process of intervention development and present the resulting novel framework for intervention development. The research comprised four workstreams: literature review (WS1), qualitative study (WS2), intervention development and implementation (WS3) and evaluation (WS4). Due to time constraints, we employed a parallel design for WS1–3 with the findings of WS1–2 informing WS3 on a continual basis. WS3 was underpinned by the Behaviour Change Wheel. We recruited expert panels to assist with intervention development. We reflected on decisions taken to facilitate the rapid yet rigorous process of

Kathrine Gibson Smith and Kathryn B. Cunningham are co-first authors.

Funding information
Chief Scientist Office, Grant/Award Number: Rapid Research in Covid -19

intervention development. The empirical output was a theoretically informed and evidence-based intervention strategy to underpin interventions to support doctors' well-being during COVID-19 and beyond. The methodological output was a novel framework that facilitates rapid and rigorous development of interventions. The intervention strategy provides a foundation for development and evaluation of tailored interventions to support doctors' well-being. The novel framework provides guidance for the development of interventions where the situation demands a rapid yet rigorous development process.

KEYWORDS
behaviour change, intervention, medicine, methodology, resilience, well-being

INTRODUCTION

Background

> Right now, supporting doctors' ... wellbeing could hardly be more vital (British Medical Association, 2020b).

There is rising recognition of the importance of supporting doctors' well-being and resilience in everyday practice due to increasing evidence of poor well-being and resilience in doctors and resultant challenges to patient safety, patient satisfaction, retention of doctors and doctors' own health (Dyrbye & Shanafelt, 2016; Hall et al., 2016; Lemaire & Wallace, 2017; Scanlan et al., 2018; West & Coia, 2019). As attested to by the above statement from the British Medical Association (BMA), the COVID-19 pandemic has augmented the importance and urgency of supporting doctors' well-being and resilience (BMA, 2020b). COVID-19 has generated additional role-specific challenges and concerns for doctors, which, coupled with the wider societal pressures the pandemic has engendered, pose a severe threat to doctors' well-being and resilience (BMA, 2020a), necessitating effective interventions to support doctors' well-being and resilience during COVID-19 and beyond.

We (the Scottish Medical Education Research Consortium [SMERC]) were awarded funding from Scotland's Chief Scientist Office Rapid Research in COVID-19 programme to develop such interventions. Given that interventions to support doctors' well-being and resilience during COVID-19 and beyond were required immediately—reflected in the funder-stipulated 6-month timeframe for the work—it was essential to develop such interventions quickly, whilst simultaneously maintaining rigour in the process. The importance of the latter point has been emphasised in papers outlining COVID-19-related research priorities in psychological and mental health science (Holmes et al., 2020; O'Connor et al., 2020). The accelerated pace of research

necessitated by COVID-19 and the associated new ways of working are receiving extensive attention with regard to clinical research, particularly in the area of vaccine development (Administration, 2020; Deming et al., 2020; Krammer, 2020; Lurie et al., 2020). However, less attention has been paid to the analogous accelerated pace and new ways of working required in COVID-19-related social and psychological research, including in the field of complex intervention development. Traditional methods of intervention development are recognised to be insufficient when solutions are needed immediately (Hawe, 2015); however, we were unable to identify any guidance regarding rapid yet rigorous intervention development. Achieving a successful combination of rapidity and rigour in the intervention development process therefore required the development of new ways of working, both in designing and conducting the research.

Objectives

The aim of this paper is twofold: (1) To outline our development of a theoretically informed and evidence-based intervention strategy to underpin interventions to support the well-being and resilience of doctors in Scotland during COVID-19 and beyond; (2) to delineate the new ways of working that were employed to ensure a rapid and rigorous process of intervention development and present the resulting novel framework for complex intervention development.

Development and evaluation of specifically tailored interventions underpinned by the intervention strategy are currently underway—an overview of these can be found in Walker et al. (2020), and manuscripts containing further details of the development and evaluation are in preparation.

METHODS

Research programme design

Our approach to intervention development followed best practice guidance of the Medical Research Council (MRC) (Craig et al., 2008) and O'Cathain et al. (O'Cathain et al., 2019). This paper focusses on two elements of the 'Development' process of the MRC guidance: identifying the evidence base and identifying/developing theory. The research comprised four workstreams: Scoping literature review (Workstream 1 [WS1]); Qualitative interviews and longitudinal audio-diary study (Workstream 2 [WS2]); Intervention development and implementation (Workstream 3 [WS3]) and Evaluation (Workstream 4 [WS4]). These were designed and conducted by a multidisciplinary research team, comprising academics and clinicians with skills and expertise in medical education, health psychology, behaviour change, well-being, evidence synthesis, qualitative methodologies, intervention development and evaluation. We employed a parallel research programme design in which WS1, WS2 and WS3 were undertaken concurrently such that the findings of WS1 and WS2 fed into, and informed, WS3 on a continual basis (Table 1). Strategies advocated in the best practice guidance were incorporated in the workstreams in order to ensure rigour in the process of intervention development and thus enhance the likelihood of effectiveness of the resulting interventions. These strategies included reviewing the relevant evidence base (WS1),

TABLE 1 Workstream methods and aims

	Workstream	Team	Method	Aim
Parallel conduct	1	Workstream 1 Leads Chief Investigator Research Assistant	Scoping literature review	To identify pre-existing interventions to support the well-being of healthcare workers during a pandemic or other crisis.
	2	Workstream 2 Leads Chief Investigator Research Fellow 1 Research Assistant	Qualitative interviews and longitudinal audio-diary study	To explore how doctors across the career continuum experienced and were impacted by multiple transitions during and beyond COVID-19 across the career continuum.
	3	Workstream 3 Leads Chief Investigator Research Fellow 2 Research Assistant	Intervention development and implementation—this involved co-development with the expert panels	To develop evidence-based, interventions to support doctors' well-being and resilience during COVID-19 and beyond.

employing appropriate theory (WS3), using a participatory approach in which empirical data collection was undertaken with the target group—doctors across the career continuum (WS2), and co-developing interventions with external expert panels (WS3).

The focus of this paper is WS3: Intervention development and implementation. We refer to WS1 and WS2—the workstreams feeding into, and informing, intervention development—where relevant. The methods and detailed findings of these are provided elsewhere (Cairns et al., 2021; Johnston et al., 2021; Walker et al., 2020). We follow the Enhancing the QUAlity and Transparency Of health Research (EQUATOR) network guidelines for reporting intervention development studies in health research (Duncan et al., 2020) to report the intervention development process.

Participants

Due to the broad nature of well-being and the need to identify specific concerns and behaviours to target for intervention development, as well as the need for practical insights into the ever-changing clinical environment during the COVID-19 pandemic and what did/would or did not/would not work in practice, we recruited two external expert panels to assist in developing the interventions. Each of these panels comprised a mix of intervention development experts, that is, senior academics experienced in intervention development, and stakeholders in doctors' well-being and resilience, that is, practising doctors (Expert Panel 1: $n = 7$, Expert Panel 2: $n = 6$) identified through the full research team's ($n = 14$) professional networks. In addition,

the full research team assisted with the intervention development via participation in two workshops to refine findings from the Expert Panels. Informed consent was obtained from all participants prior to participation.

Theoretical framework

Supporting doctors' well-being and resilience requires both organisations and individuals to take action, that is, undertake particular behaviour changes. Therefore, the Capability, Opportunity, Motivation—Behaviour (COM-B) model and the Behaviour Change Wheel (BCW) (Susan Michie et al., 2011), supplemented by the Theoretical Domains Framework (TDF) (Cane et al., 2012; Michie et al., 2005), were selected as appropriate underpinning theoretical frameworks for intervention development. These models are advantageous as they are evidence-based, have been usefully applied in multiple settings (Barker et al., 2016; Jatau et al., 2019; McGowan et al., 2020; Mosavianpour et al., 2016; Nickbakht et al., 2020; Timlin et al., 2020; Turner et al., 2021) and can be interpreted and applied relatively easily (Cane et al., 2012; Michie et al., 2005; Susan Michie et al., 2011).

The COM-B model is a framework for understanding behaviour in which behaviour is viewed as part of an interacting system involving three components: (1) *capability* to perform a behaviour (determined by psychological and physical capacity/incapacity); (2) *opportunity* to perform a behaviour (determined by enabling/disabling external social and physical factors); (3) *motivation* to perform a behaviour (determined by energising/discouraging automatic and reflective mental processes).

The TDF is an integrative framework developed from a synthesis of psychological theories. It incorporates individual and organisational determinants of behaviours, including cognitive, affective, social and environmental influences. It synthesises determinants of behaviour at a higher level of specificity than COM-B. The BCW is a framework for intervention development that has the COM-B at its core and maps the behavioural components to intervention functions and policy categories, facilitating an informed and parsimonious process of intervention development.

Process of intervention development

Underpinned by the theoretical framework, the intervention development process involved three stages: determining behaviour(s) to be targeted for intervention; identifying intervention options; establishing intervention content and implementation options. Each stage involved several steps—these are detailed in Table 2. All data subject to COM-B and TDF analysis were independently coded by multiple members of the research team to enhance rigour. The findings of WS2—Qualitative interviews and longitudinal audio-diary study—fed directly into stage 1, and the intention was for the findings of WS1—Scoping literature review—to feed into, and inform, Stages 2 and 3. However, the review did not identify any high-quality pre-existing interventions to support the well-being of healthcare workers during a pandemic or other crisis (Cairns et al., 2021).

As the study progressed, it became apparent that different subgroups of doctors (e.g., trainee, career grade, primary and secondary care doctors, etc.) had different needs and preferences in terms of support for well-being and resilience. Thus, in line with

TABLE 2 Steps involved in the Behaviour Change Wheel stages

Stage of BCW	Stage of project
Stage 1: Determining behaviour(s) to be targeted for intervention	
1. Define the problem in behavioural terms	WS2 team undertook interim analysis of interview data ($n = 20$ doctors diverse in career grade, NHS Health Board and socio-demographics) to identify main areas considered critical to doctors' well-being and resilience Main areas presented to Expert Panel 1 that discussed then ranked areas according to importance for intervention development
2. Select target behaviour	WS3 team undertook data-driven behavioural analysis to identify specific target behaviours pertaining to prioritised areas WS2 team undertook analysis of further interview data ($n = 12$ doctors diverse in career grade, NHS Health Board and socio-demographics) concerning prioritised areas to uncover any target behaviours not represented in the initial analysis
3. Specify the target behaviour	Full research team discussed then ranked specific target behaviours according to importance for intervention and ability to be addressed within short timeframe
4. Identify what needs to change	Key target behaviours prioritised for intervention presented to Expert Panel 2 that generated intervention ideas targeting those behaviours then ranked those intervention ideas according to importance for further development Full research team discussed and further refined key target behaviours important for intervention and able to be addressed within short timeframe then discussed prioritised intervention ideas and took decision regarding which to take forward for intervention development WS3 team undertook analysis of Expert Panel 2 workshop and subsequent full research team discussion using COM-B and TDF to identify what was required in terms of Capability, Opportunity and Motivation for target behaviours to occur
Stage 2: Identifying intervention options	
5. Identify relevant intervention functions	WS3 team selected relevant intervention functions from BCW using APEASE criteria (affordability, practicability, effectiveness, acceptability, safety and equity)
6. Identify relevant policy categories	WS3 team identified policy categories from BCW that would support delivery of intervention functions identified in Step 5.
Stage 3: Establishing content and implementation options	
7. Identify relevant behaviour change techniques	WS3 team identified relevant Behaviour Change Techniques (BCTs) for operationalising the relevant intervention functions using the BCT Taxonomy. BCTs were identified from the 'most frequently used' as per the BCW guide (Michie et al., 2011).
8. Identify relevant mode(s) of delivery	WS3 team identified the most appropriates modes of delivery using the Taxonomy of Modes of Delivery

Abbreviations: BCW, Behaviour Change Wheel; COM-B, Capability, Opportunity, Motivation—Behaviour; TDF, Theoretical Domains Framework.

suggested caution regarding the role of clinical psychological science in the context of COVID-19 (Gruber et al., 2020), that interventions for healthcare workers should take a tailored rather than a one-size-fits-all approach, we developed an overarching intervention strategy to underpin multiple interventions to support differing needs and preferences of doctors.[1]

Approvals

The research received ethical approval from the University Ethics Review Board and NHS Research and Development approval from all 14 territorial Health Boards in Scotland.

Reflexivity

In designing and conducting the research, we recorded decisions taken to facilitate the process of rapid and rigorous intervention development in order to ensure transparency and credibility. As a team, we reflected on how those decisions affected the success of the process of developing interventions rapidly, whilst maintaining rigour.

RESULTS

Empirical findings

Stage 1 Determining the behaviour(s) to be targeted for intervention

Main areas considered critical to doctors' well-being and resilience were identified from the initial analysis of interview transcripts ($n = 20$). These were presented to Expert Panel 1 to prioritise according to importance for intervention. Prioritised areas were identified from WS2 findings and were formulated into behaviours to be targeted by interventions. To ensure robustness, analysis of additional transcripts ($n = 12$) was undertaken to identify any further behaviours falling within each area. No new behaviours were generated from this analysis. The full research team subsequently ranked these behaviours according to amenability to intervention (Table S1).

The top prioritised behaviours were presented to Expert Panel 2. The panel developed intervention ideas in relation to multiple (i) target areas and (ii) target behaviours. The panel was asked to conceive intervention ideas in relation to who needs to act; what they need to do; when they need to do it; where they need to do it; with whom do they need to do it. The panel prioritised intervention ideas in relation to their importance. In line with the panel's prioritisation of intervention ideas targeting accessing informal and formal psychological support, the further discussion and refinement undertaken by the full research team established these behaviours as targets for intervention. Accordingly, all intervention ideas developed and prioritised by the panel were taken forward for integration within the intervention strategy and potential development (Table S1). Prioritised target behaviours and intervention ideas were as follows:

Prioritised target behaviours: accessing informal psychological support; accessing formal psychological support.
Prioritised interventions: informal support within teams—with time given and senior level accountability (accessing informal psychological support); listening leaders—two-way communication via open fora, floor walking (accessing informal psychological support); a buddying system involving check-ins (accessing informal psychological support); reduce stigma of accessing formal support (accessing formal psychological support).

The analysis of the Expert Panel 2 workshop audio recording and notes and the subsequent full research team discussion identified 10 of the 14 TDF domains, which mapped to each component of the COM-B, as relevant to accessing informal and formal psychological support: Skills; Knowledge; Behavioural regulation; Environmental context and resources; Social influences; Professional/social role and identity; Beliefs about capabilities; Beliefs about consequences; Reinforcement; and Emotion.

Stage 2 Identifying intervention options

Six intervention functions were perceived to be relevant for interventions related to accessing informal and formal psychological support. These were Education; Persuasion; Training; Environmental Restructuring; Modelling; Enablement. Further, intervention functions were matched to related policy categories, which were perceived to accessing informal and formal psychological support. These were Communication or Marketing; Guidelines; Service Provision; Regulation; Environmental or Social Planning.

Stage 3 Identifying intervention content and implementation options

Behaviour change techniques (BCTs) were identified in relation to intervention functions (Table S1) and included the following: Information about social and environmental consequences; Information about health consequences; Prompts/cues; Self-monitoring of behaviour; Credible source; Feedback on the behaviour; Instruction on how to perform a behaviour; Feedback on the outcome of the behaviour; Demonstration of behaviour; Adding objects to the environment; Restructuring the physical environment; Social support; Goal setting. The most appropriate mode of intervention delivery was perceived to be both individual and face-to-face incorporating broadcast and digital media strategies (TV, internet and app).

Empirical output: Theoretically informed and evidence-based intervention strategy

This process resulted in the establishment of a theoretically informed and evidence-based intervention strategy (Table S1) to underpin interventions to support doctors' well-being and resilience during COVID-19 and beyond, with a specific focus on promoting doctors' accessing informal and formal psychological support. The intervention strategy incorporated relevant intervention functions and associated BCTs operationalising those functions (Table S1).

Methodological findings

The empirical findings and output demonstrate that the decisions we took in the design and conduct of the research were successful in enabling a rapid process of intervention development, whilst maintaining rigour. The factors we believe enabled this success include a resourced parallel research programme; the multidisciplinary research team; effective communication between WS1, WS2 and WS3; the co-development with external experts and stakeholders; and the adoption of an adaptive theoretical framework. Further details regarding each of these are presented below, and the relationships between them are illustrated in Figure 1.

Resourced parallel research programme

Resources to support the parallel conduct of WS1, WS2 and WS3 were a key factor in the success of the research. Funding to finance sufficient personnel to enable all workstreams to be undertaken concurrently was secured quickly via Scotland's Chief Scientist Office Rapid Research in COVID-19 programme. This resulted in optimal staff numbers with appropriate time allocated to the project.

Multidisciplinary research team

Whilst the concept of multidisciplinary working, and its associated benefits, in research is not new, we believe that the diversity of expertise across the research team facilitated effective working in parallel and at pace as it enabled allocation of appropriate expertise and leadership to each workstream, with experienced Principal Investigators leading each workstream and the

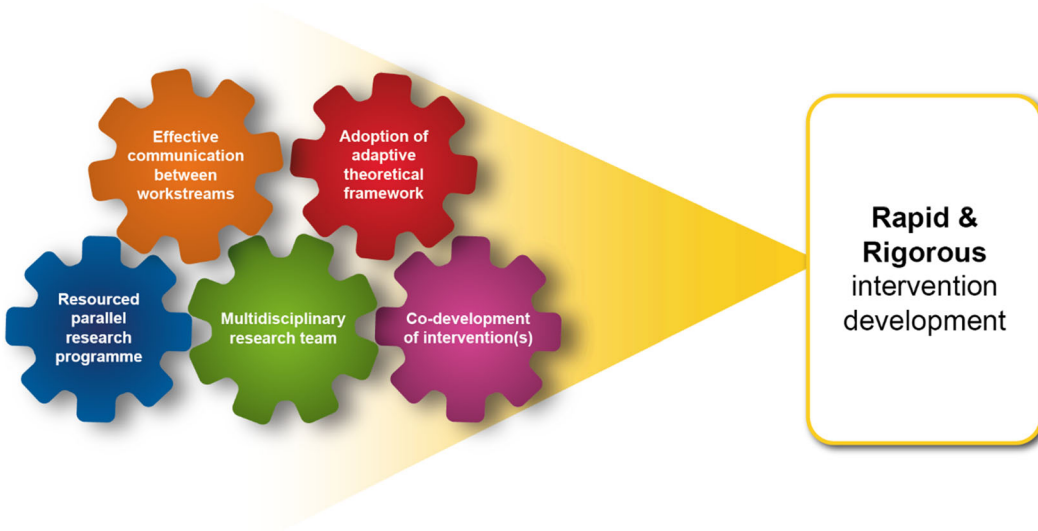

FIGURE 1 Framework for rapid and rigorous intervention development [Color figure can be viewed at wileyonlinelibrary.com]

Chief Investigator overseeing all workstreams. Researchers in WS1 were clinicians and academics with expertise in evidence synthesis; researchers in WS2 were academics experienced in qualitative interview techniques and audio-diary methods; researchers in WS3 were academics specialising in intervention development and with experience of using the COM-B model, the TDF and the BCW. Input from the multidisciplinary team to WS3—Intervention development and implementation—also facilitated rapidity in the development process, due to insights into what was relevant for supporting doctors' well-being and resilience and what would/would not work in practice.

Effective communication between workstreams

Effective communication supported the parallel conduct of the workstreams. This was achieved via feeding of WS1 and WS2 findings into WS3 on a continual basis to allow progress to be made on the basis of findings from preliminary data. This enabled the intervention development process to be iterative and responsive to emergent findings. Effective communication at WS and full research team levels helped identification of any operational issues and reconciliation of any differences. Frequent meetings of collaborators based in different institutions were virtual—enabled by remote working. Additionally, two members of the research team—the Chief Investigator and a full-time Research Assistant—were part of all three workstreams, facilitating streamlined communication between workstreams and focussed data collection relevant for WS3 as part of WS2.

Co-development of intervention(s)

Adopting a co-development approach facilitated a rapid intervention development process. Due to participants' insights into the ever-changing clinical environment during the COVID-19 pandemic, the external expert panels were able to establish the areas of well-being and specific behaviours to be targeted for intervention and also to advise on what already existed 'on the ground' and what did/would and did not/would not work in practice. This ensured no duplication of effort or development of interventions that would not be feasible or acceptable to the target population.

Adoption of adaptive theoretical framework

The selection of a theoretical framework that can be operationalised by users with or without specialist training in psychology facilitated a rapid intervention development process within our multidisciplinary research team and for the co-development with the external expert panels. The core concepts of the BCW are readily understood, and the overarching framework is explicit in how it leads to intervention development. We found that the systematic and pragmatic approach to intervention development resonated well with all members of the research team and expert panels, despite differing backgrounds and training. This facilitated effective communication and meant it was not necessary to spend valuable time familiarising team and expert panel members with psychological terminology and concepts.

Methodological output: A framework for rapid and rigorous intervention development

The insights resulting from our reflexive analysis enabled development of a novel framework to facilitate rapid and rigorous development of complex interventions (Figure 1). In this framework, the key mechanisms for a rapid and rigorous process of intervention development are

a. A resourced parallel research programme, facilitated by a multidisciplinary research team and effective communication between workstreams—supported by the adoption of an adaptive theoretical framework;
b. Input from the multidisciplinary research team to the intervention development workstream and co-development of the intervention(s) with external expert panels—both facilitated by the adoption of an adaptive theoretical framework.

DISCUSSION

To our knowledge, the research we have presented is the first to develop a theoretically informed and evidence-based intervention strategy to underpin interventions to support doctors' well-being and resilience during a pandemic. Again, to our knowledge, this paper is also the first to provide a framework for complex intervention development that is both rapid and rigorous.

Interpretation of findings

We have used the BCW to develop an intervention strategy to inform the development of multiple interventions to support doctors in accessing both informal and formal psychological support (Garelick, 2012; Mehta & Edwards, 2018).

This research provides an evidence base with which to move forward with intervention development. Use of the TDF and the BCW methodology has identified relevant intervention functions and BCTs, which may be utilised in interventions to support doctors' well-being and resilience during COVID-19 and beyond, specifically in relation to accessing informal and formal psychological support. We are using the strategy to take forward development, implementation and evaluation of a series of interventions that incorporate the relevant intervention functions and associated BCTs identified in this research. The intervention functions are Education; Persuasion; Training; Environmental restructuring; Modelling; Enablement. The associated BCTs operationalising those functions are Credible source; Information about health, social and environmental consequences; Instruction on how to perform a behaviour; Feedback on the behaviour; Feedback on the outcome of the behaviour; Self-monitoring; Adding objects to the environment; Prompts/cues; Restructuring the physical environment; Demonstration of behaviour.

The findings of the empirical element of this research map onto the British Psychological Society's (BPS) recommendations for a stepped psychological response in their guidance document 'The psychological needs of healthcare staff as a result of the Coronavirus pandemic' (The BPS, 2020). They advise that formal psychological support is provided in a graded manner progressing from ensuring the most basic needs of staff are met along with the provision of

physical resources, to provision of information and promotion of peer support, to provision of psychological first aid and finally, pressing forward with psychological intervention. The resultant interventions being developed as a result of the evidence base from this research map onto the 'Psychological Response Phases,' which are outlined in the BPS recommendations (preparation phase, active phase and recovery phase of the pandemic) and ensure that support for doctors' well-being and resilience will be sustained beyond the conclusion of this pandemic.

Moreover, we have outlined a methodological framework that may be utilised to guide rapid and rigorous intervention development in contexts that necessitate accelerated development of interventions. Whilst multiple guides and frameworks exist to support rigorous intervention development (e.g., Duncan et al., 2020; O'Cathain et al., 2019), to our knowledge, there is no framework to guide rapid intervention development. The current pandemic has highlighted the need for pragmatic intervention development that can be delivered at an accelerated pace. We have exemplified, in the context of our research to support doctors' well-being and resilience during the pandemic, how new ways of working enabled rapid and rigorous intervention development to address an urgent societal need.

Our findings suggest that when situations require rapid and rigorous intervention development, researchers consider the following factors, which may assist in such endeavours: a parallel research programme design in which the intervention development workstream and other workstreams informing intervention development are undertaken concurrently, with adequate financial and personnel resources to support this and effective communication between workstreams; a multidisciplinary research team spread across workstreams in accordance with skills and expertise and with all members having input to the intervention development workstream; co-development of intervention(s) with key stakeholders and experts who understand the landscape in which interventions are to be implemented; adoption of an adaptive theoretical framework to facilitate intervention development and communication. It is noteworthy that a number of factors that promote rapid intervention development are already advocated for rigorous intervention development (O'Cathain et al., 2019).

Strengths and limitations

A key strength of the research was that our approach to intervention development was in line with the best practice guidance of the MRC (Craig et al., 2008) and O'Cathain et al. (2019), with several strategies employed to ensure rigour in the process of intervention development, thus enhancing the likelihood of the interventions being effective. These strategies included reviewing the relevant evidence base, employing appropriate theory, using a participatory approach in which empirical data collection was undertaken with the target group—doctors across the career continuum—and co-developing interventions with external expert panels.

The triangulation of data from different sources was a further strength of the research, as noted by Guba and Lincoln (1999). As well as academic experts from a range of disciplines, practising doctors were involved in the generation of intervention ideas. In addition, the research team comprised clinicians and academics of differing backgrounds, thus providing multiple perspectives—this further added to the rigour of the research.

Additionally, the use of the BCW and TDF enhanced the transferability of research. This was particularly pertinent since the research was conducted in Scotland and hence may have been limited in application to other geographical areas and healthcare systems. However, integration of a theoretical approach has enabled identification of the key components of an

intervention that are relevant to accessing informal and formal psychological support amongst doctors and hence may be transferred to other contexts out with Scotland.

A greater focus on barriers to change associated with TDF domains identified in the behavioural analysis would have strengthened this research. Further, due to the accelerated pace at which the interventions had to been developed and delivered it was necessary to consider what was feasible in terms of recruitment and data collection. Typically, the qualitative data obtained from WS2 would have been fully analysed prior to undertaking the expert panel workshops; however, the tight timeline directed that we undertook a preliminary analysis of a large subsample and presented preliminary findings to our participants. As reported, to address this limitation and enhance robustness, we did conduct an additional analysis of further interview data to ensure that all relevant behaviours were captured, and no new additional findings were generated.

Lastly, this research was not just restricted to promoting doctors' well-being and resilience over the course of the COVID-19 pandemic but was developed to ensure that doctors are supported beyond the pandemic. COVID-19 has illuminated many long-standing societal issues of which doctors' reduced well-being and resilience is one, and this research served to address a need that has been neglected for some time. Extension of these interventions is critical in ensuring sustained support for doctors' well-being and resilience beyond this pandemic.

Recommendations

In relation to the empirical output, we recommend the urgent prioritisation of supporting doctors' well-being and resilience via development, implementation and evaluation of interventions that enable access to informal and formal psychological support. We present an intervention strategy to underpin the development of specific tailored interventions, and whilst we are progressing such intervention development and evaluation, we also encourage others to employ/adapt as appropriate our intervention strategy to develop and evaluate interventions to support doctors' well-being and resilience during COVID-19 and beyond in other contexts. The use of the BCW has enhanced the transferability of our research. Accordingly, researchers may wish to 'test' the appropriateness of transferring, or adapting, our intervention strategy to other contexts where doctors, and other healthcare professionals in similar working environments, may be supported in accessing informal and formal psychological support. Our intervention strategy provides an evidence base with which to move forward with intervention development in these areas.

In relation to the methodological output, we recommend that the framework for rapid and rigorous intervention development be employed, and adapted if necessary, as a simple guide to inform and drive rapid and rigorous intervention development across topics and contexts, when the situation requires that interventions be developed at an accelerated pace.

Conclusion

This paper has outlined the development of an intervention strategy that serves as a foundation for the development of tailored interventions to support the well-being and resilience of doctors in Scotland during COVID-19 and beyond and also the outcome and process evaluation of those interventions. The paper has also presented a framework for rapid and rigorous

intervention development, which provides guidance for the development of complex interventions across topics and contexts, when the situation demands a rapid yet rigorous development process.

ACKNOWLEDGMENTS

We would like to thank all our study participants and Expert Panel members for their invaluable contributions to the research and to Craig Lee, at University of Aberdeen, for his illustrative expertise. We would also like to thank the Chief Scientist Office, Scotland for supporting the research.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in the supplementary material of this article.

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ENDNOTE

[1] An overview of the tailored interventions the strategy underpinned can be found in Walker et al. (2020), and manuscripts containing further details of their development and evaluation are in preparation.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

How to cite this article: Gibson Smith, K., Cunningham, K. B., Cecil, J. E., Laidlaw, A., Cairns, P., Scanlan, G. M., Tooman, T. R., Aitken, G., Ferguson, J., Gordon, L., Johnston, P. W., Pope, L., Wakeling, J., & Walker, K. A. (2022). Supporting doctors' well-being and resilience during COVID-19: A framework for rapid and rigorous intervention development. *Applied Psychology: Health and Well-Being*, *14*(1), 236–251. https://doi.org/10.1111/aphw.12300