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What do healthcare professionals want from a resource to support person-centred conversations on physical activity? A mixed-methods, user-centric approach to developing educational resources

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ABSTRACT

Objectives Healthcare is a fundamental action area in population efforts to address the global disease burden from physical inactivity. However, healthcare professionals lack the knowledge, skills and confidence to have regular conversations about physical activity. This study aimed to: (1) understand the requirements of healthcare professionals and patients from a resource to support routine physical activity conversations in clinical consultations and (2) develop such a resource.

Methods This study used codesign principles across two phases, actively involving relevant stakeholders in an iterative development process. The preparatory phase included a scoping literature review and workshops with multidisciplinary healthcare professionals and patients. The Delphi phase included the development of a draft resource, a three-stage modified online Delphi study and an external review.

Results The scoping review highlighted the importance of addressing time restrictions, a behaviour change skill deficit, the need for resources to fit into existing systems and meeting patient expectations. Consultation included 69 participants across two clinical workshops. They recommended using the internet, valued guidance on all aspects of physical activity conversations and were concerned about how to use a person-centred approach. The Delphi phase, including 15 expert participants, met agreement criteria in two stages to develop the resource.

Conclusion This mixed-methods study delivered an online resource that was codesigned with and based on the requirements of healthcare professionals and patients. The resource presents condition-specific '1-minute', '5-minute' and 'more minute' person-centred and evidence-based conversation templates on physical activity in an accessible and usable format to meet the needs of real-life clinical practice.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Healthcare professionals are essential contributors to population efforts to increase physical activity.
⇒ The physical activity knowledge, skills and confidence of healthcare practitioners are low.
⇒ There is a lack of physical activity tools and educational resources available to help healthcare professionals.

WHAT THIS STUDY ADDS

⇒ Healthcare professionals want in-depth evidence on physical activity and specific conditions to be available and presented in an accessible hierarchy using hyperlinks on a web platform so they can choose what they need.
⇒ '1-minute', '5-minute' and 'more minute' person-centred conversations are flexible enough to meet the demands of healthcare professionals and patients.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE AND/OR POLICY

⇒ The resource developed during this study will help healthcare professionals talk to people about physical activity and is freely available online at www.movingmedicine.ac.uk
⇒ Future research should seek to test the resources developed during this study to determine efficacy and help improve the format and function of resources to better support conversations on physical activity in the management of long term conditions.
⇒ Comprehensive evaluation is required of system-wide implementation projects to understand how to use these resources to improve continuity and support people as they journey through healthcare services in their long-term management of health conditions.

INTRODUCTION

A strong and rapidly developing body of evidence defines the health risks of physical inactivity and the role of therapeutic physical activity in treating chronic medical conditions.[1–3] The WHO recognises physical

inactivity as the fourth leading risk factor for global morbidity and premature mortality, being directly responsible for 6% of deaths globally[4] and the cause of more deaths than smoking.[2]

Healthcare is a fundamental component of population-level approaches to addressing the inactivity burden and is essential due to the sector's contact with, and potential to influence, people living with health conditions.[5 6] Individuals living with health conditions are among the least active in society and generally become even less active following diagnosis.[2] Consequently, this group stands to gain the most from even small increases in physical activity to treat existing and prevent new medical conditions.[7]

Healthcare professionals are a central part of the systems-wide approach required to drive change and improve the delivery of physical activity.[6 8] Routine person-centred conversations between healthcare professionals and their patients offer a vital intervention area.[9–13] Healthcare professionals repeatedly report lacking the skills and confidence required to effectively counsel people living with a health condition on physical activity.[14–21]

There is a lack of tools and education platforms to operationalise physical activity conversations in healthcare.[18 22] Furthermore, generic resources and efforts to improve behaviour change skills in other domains such as smoking cessation and weight loss do not appear to translate to improved physical activity confidence and skills.[23 24] Meaningful patient involvement in quality improvement initiatives helps drive quality and innovation and is recommended for novel approaches to clinical resource development.[25] Codesign (also called coproduction or cocreation) is an approach that focuses on actively involving all relevant stakeholders to help ensure a design process meets their needs so that educational resources and service provision models are usable in real-life scenarios.[26 27] Codesign principles were used in this study to address the following aims:

1. Understand the requirements of healthcare professionals and patients from a resource to support routine physical activity conversations in clinical consultations
2. Develop and test such a resource.

METHODS

Study design

Two study phases, reflecting the two study aims, are outlined in figure 1. To understand the requirements of healthcare professionals around physical activity conversations, the preparatory phase included a scoping literature review and consultation workshops with multidisciplinary healthcare professionals and patients. The Delphi phase aimed to iteratively develop and test such a resource over three rounds.

Codesign principles were employed throughout, engaging multidisciplinary healthcare professionals who will use the resource and people living with medical conditions with whom the healthcare professionals will use it. The Delphi method was chosen for its ability to collate a diverse set of expert opinions anonymously and without social pressure or a 'bandwagon effect'.[28 29] Codesign enabled the Delphi phase of the study to focus on the iterative development of a resource that repackaged the physical activity evidence base into a clinically relevant and accessible format with input from a range of stakeholders through the generation of ideas and solutions rather than just in-depth analysis.[30–32]

Patient and public involvement

Patient representatives identified through patient support groups of local charities attended the workshops. In the workshops, they were spread between groups to help understand and discuss the balance of perspectives required for conversations on physical activity in clinical practice. Their opinions directly informed resource design, and they subsequently contributed to external review and the development and dissemination of patient-facing information resources.

Preparatory phase

Scoping review

We undertook a scoping review following the five-stage protocol by Arksey and O'Malley reported according to the Preferred Reporting Items for Systematic Reviews

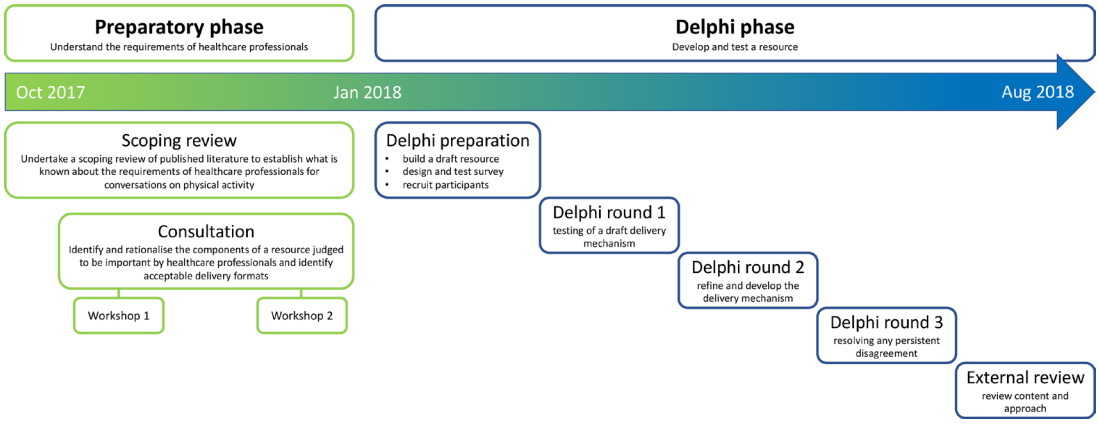

Figure 1 Structure and objectives of each Delphi study phase.

and Meta-Analyses extension for scoping reviews checklist.[33–35] The review explored published literature, guidelines and online resources, aiming to gain a broad overview of the context of physical activity consultation in healthcare. It addressed two research questions: (1) what is known about the effectiveness and acceptability of physical activity consultations in healthcare? and (2) what is known about strategies to implement routine physical activity conversations in healthcare?[35]

Consultation

We led two focused, interactive workshops informed by results from the scoping review (see online supplemental file 2). The workshops aimed to identify and rationalise the components of a resource judged to be important by healthcare professionals and identify acceptable delivery formats. Through professional contacts, we identified two multidisciplinary regional specialist networks to participate in the workshops. The first workshop focused on inflammatory rheumatic disease and the second on musculoskeletal pain. We summarised results from the workshops and organised them thematically to inform the development of a draft resource in the Delphi phase.

Delphi phase

We used a modified electronic Delphi process to collect data from remote contributors and facilitate automated data collection.[36 37] We used the commercial software 'SurveyMonkey'[38] for the survey rounds and followed the Conducting and REporting Delphi Studies guidelines throughout.[32]

Building a draft resource

We commissioned a design agency and gave them a design brief based on findings of the preparatory phase. Design agency members also attended preparatory phase workshops to improve their understanding of the content and objectives. We developed a wireframe draft resource in conjunction with the design team through meetings, phone calls and email communication. The wireframe resource enabled the exploration of content, navigation and function during round 1 of the Delphi study without requiring the investment of a complete website build.

Developing and testing the survey

We developed and tested an online survey based on the structure and content of the wireframe resource, which reflected the development priorities outlined during the preparatory phase. Three clinicians not involved in the study piloted the survey before distribution to ensure usability by testing the structure and wording.[28 39] We kept the completion time target below 30 min to reduce participant fatigue.[40]

Participant recruitment

We formed an expert panel by purposive sample to generate a deliberately heterogeneous group of multidisciplinary participants with expertise covering healthcare, physical activity, behavioural change and digital education.

According to recommendations for a Delphi study requiring in-depth feedback and continuity, 15 is a sufficient number of participants.[31 41 42] We identified potential participants through professional and academic networks and established research interests with relevant publications. We invited participation by direct email, and where participants did not reply to the initial contact, we sent one further invitation email.

Following round 1, we contacted all participants by email and invited them to participate in round 2. In addition, three reminder emails were sent out for those who had not completed the second-round questionnaire: (1) a repeat of the initial invitation 2 weeks before the survey closing, (2) a reminder at 1 week and (3) a final reminder 2 days before survey closure.

Delphi rounds

Round 1 of the online Delphi aimed to test the structural components of the wireframe website and appraise preliminary design concepts. Round 2 involved testing a website built following round 1. Finally, round 3 enabled the resolution of any persistent disagreement if necessary.

Between-round feedback

Following each round, we prepared and distributed individualised feedback comparing individual responses to the group average for each question. This was a straight reproduction of the participant's own words to avoid biasing responses in subsequent rounds.[42] We also provided all participants with a summary of free-text feedback and a comprehensive list of and rationale for all actions taken (see figure 2).

Delphi consensus criteria

In keeping with described methods,[32 39 42] we defined satisfactory agreement (consensus) 'a priori' according to the criteria outlined in figure 3.

External review

We identified three external groups to review the Delphi study's outputs and circulated resources electronically to these groups after completing the Delphi rounds requesting open-text feedback via email. The objective of this feedback was to review the content and assess the feasibility and applicability of the approach recommended by the Delphi group. The groups were:

- An academic external validation group appointed through the Moving Medicine initiative.
- Funding and commissioning bodies at the Faculty of Sport and Exercise Medicine, Sport England and Public Health England.
- Collaborating professional bodies including the Royal College of Physicians, Royal College of Nurses, Royal College of General Practitioners, Chartered Society of Physiotherapists, Academy of Medical Royal Colleges, the British Association of Sport and

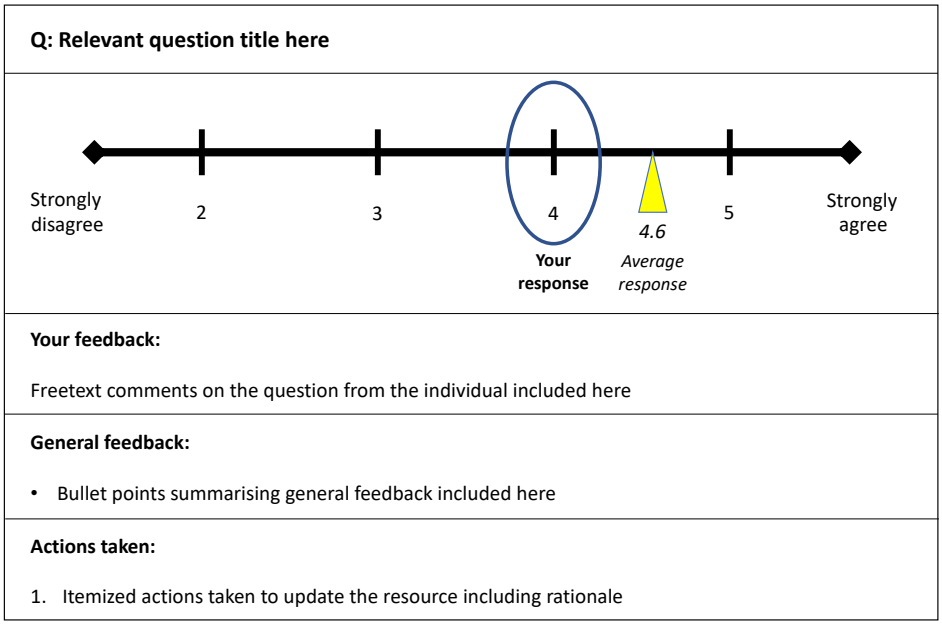

Figure 2 Format for individualised feedback on each question.

Exercise Medicine and the patient representatives of charities who had participated in the working groups.

RESULTS

Preparatory phase

Scoping review

The scoping review identified 616 references for screening (n=596 from databases and n=20 from hand searching). Following screening and removal of duplicates, 48 studies were included for analysis. Narrative results were synthesised thematically as they emerged from the data.[35] Online supplemental file 1 presents a summary of relevant findings.

Consultation

A total of 70 attendees took part in the face-to-face clinical workshops that took place in Oxford (autoimmune rheumatic disease) and Birmingham (musculoskeletal pain) in 2018 (see table 1). Healthcare professionals from a range of rheumatology, musculoskeletal and chronic pain services across England attended the workshops. The groups included doctors, nurses, physiotherapists, clinical academics and medical students. In addition, we identified patient representatives through local patient groups from the National Rheumatoid Arthritis Society and the Arthritis and Musculoskeletal Alliance,

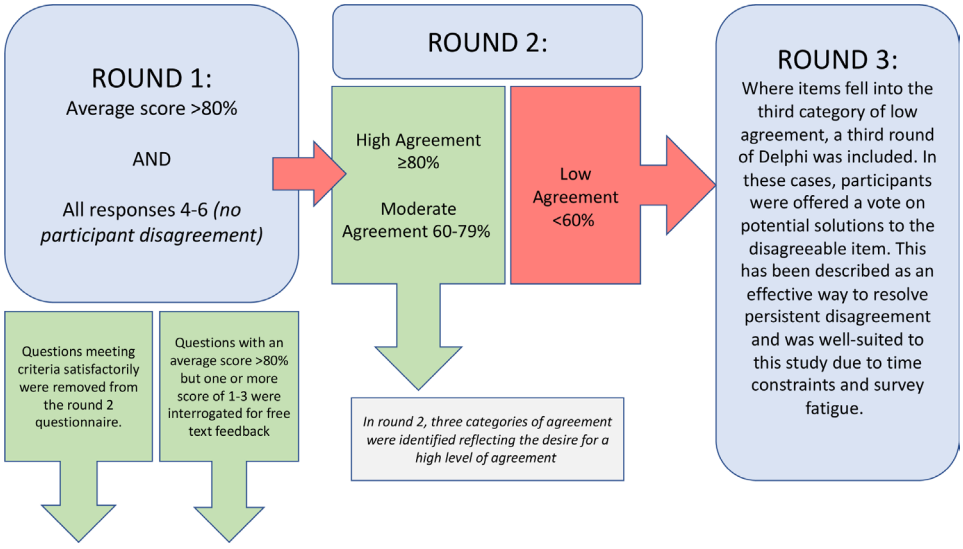

Figure 3 Definitions of consensus in each phase of the Delphi process.

Table 1 Professional mix in the preparatory workshops

	Autoimmune rheumatic disease workshop (n=37)	Musculoskeletal pain workshop (n=32)
Role		
Consultant	12	9
Specialist registrar	12	15
Physiotherapist	1	4
Nurse	4	0
Academic	2	1
Medical student	0	2
Lay representative	4	1
Designer	2	1
Gender		
Female	24	17
Male	13	16

an umbrella body in the UK connecting patient organisations and professional bodies across musculoskeletal health. Design and communication specialists from the project design team also attended. See online supplemental file 2 for more detail.

As outlined in table 2, the headline themes identified were components to support healthcare professionals directly, clinical considerations for translating evidence into practice and developing a mechanism to support access to knowledge in routine clinical care.

Delphi phase

Building a draft resource

Workshop participants identified the internet as an acceptable and scalable environment to host a resource to support conversations in everyday clinical practice. Using a website also enables delivery of the complexity of information identified as necessary. Table 3 maps preparatory phase recommendations onto solutions generated during the iterative build of the wireframe website (see figure 4).

Developing and testing the survey

We identified the following problems during survey piloting:

- Errors in question format, including mistakes in a matrix table
- Confusing question layouts when viewed on mobile devices.
- Testing recommended that the classically used nine-point scale as per the original RAND UCLA method[32 39] was an inappropriately long set of numbers for the digital screen. We selected a six-point scale instead, with the added advantage that it obliged participants to commit to either agreeing or disagreeing with statements.

Table 2 Summary of consultation workshop recommendations

Components identified to support healthcare professionals having conversations on physical activity	Condition-specific and general benefits (including symptoms).
	Directive messages to address common misconceptions.
	Safety messages addressing common concerns.
	Categories of activity (including what counts, practical suggestions and logistical considerations).
	Resources to give to patients.
	Activity recommendations that reflect disease activity.
	Gain an understanding of physical activity levels and physical activity history.
	Address perceived barriers and negative aspects of activity, for example, financial/access/time.
	Signposting to appropriate resources for support of condition management and activity opportunities.
Clinical considerations for translating the evidence into practice	A resource that cut out important information due to an arbitrary design consideration would significantly reduce usefulness and uptake among healthcare professionals, so all identified components need to be included.
	Time and prioritisation are prevalent barriers to physical activity conversations.
	Messages should be positively rather than negatively framed.
	Clinical recommendations should focus on the individual rather than reference national guidelines. Specifically, healthcare professionals and patients perceive 150 min of moderate-intensity activity per week as an unnecessary barrier to conversations with inactive people.
Developing a mechanism to support access to knowledge in routine clinical care	A person-centred approach to physical activity decision making is considered fundamental by clinicians and patients. However, clinicians lack confidence in achieving this. Both clinicians and patients recommend explicit guidance on how to approach person-centred decision making in behavioural change conversations.
	Disease-specific infographics were presented as a potential solution. Workshop participants unanimously agreed that flat infographics would not deliver the complexity of information healthcare professionals and patients require in clinical practice to support physical activity conversations.
	A resource must be flexible enough to be helpful in both a short or long period of time.
	To support conversations in practice, suggested responses to help address common concerns, such as the risks of physical activity, are helpful.
	The internet provides an accessible, acceptable and feasible route of delivery.

Table 3 Generating design solutions from preparatory phase recommendations

	Preparatory phase recommendation	Design solution
General features	Provide guidance on a conversation structure that supports different timeframes.	Three time-framed conversation templates were developed to host disease-specific information.
	Prioritise information to make it easily digestible.	Critical information is presented with hyperlinks to more detail.
	Include links to the evidence base.	A theory and evidence section included.
	Support a person-centred approach and individualised advice.	Conversation templates were developed to provide healthcare professionals with guidance on how to deliver individualised advice.
	Include positive and clear directive messaging.	'Did you know' posts created as stand-alone messages.
	Deliver via the internet.	Wireframe resource developed as a website.
Components	Physical activity history.	Include open questions and a screening tool.
	Include evidence on benefits for specific conditions.	Provide condition-specific resources with a summary of the relevant narrative evidence review.
	Address patient concerns and provide safety advice.	Enable customisation of concerns and safety advice for each condition by specialist healthcare professionals.
	Enable making a plan.	Include planning resources that can be shared with and given to patients.
	Signpost other resources and organisations.	Catalogue and hyperlink disease-specific resources from trusted sources and physical activity networks.
	Provide resources for patients to take away.	Include PDF output.
	Explain how physical activity is beneficial.	Include mechanistic explanations of symptom benefit.
	Suggest appropriate activities.	Include a list of example activities people find beneficial for each condition.

- Navigation of the wireframe website confused users, so we included images with detailed instructions to improve navigability.

Participant recruitment

We contacted 29 individuals, and 19 agreed to partake in round 1 of the study. Only 15 of 19 participants completed the survey in round 1 despite reminder emails, so only these participants were sent the round 2 survey. Ten of 15 of these participants responded to the round 2 survey. Table 4 demonstrates participant demographics.

Delphi round 1

Overall, agreement levels were high in round 1 (see table 5, full results are available in online supplemental file 3). However, there were two instances of participants registering a score or set of scores out of keeping with their free-text responses. We contacted these respondents directly to clarify their responses, and in each instance, there was an error or misunderstanding. For example, one respondent answered the scale of 1–6 the wrong way around, and another failed to open the design mock-ups

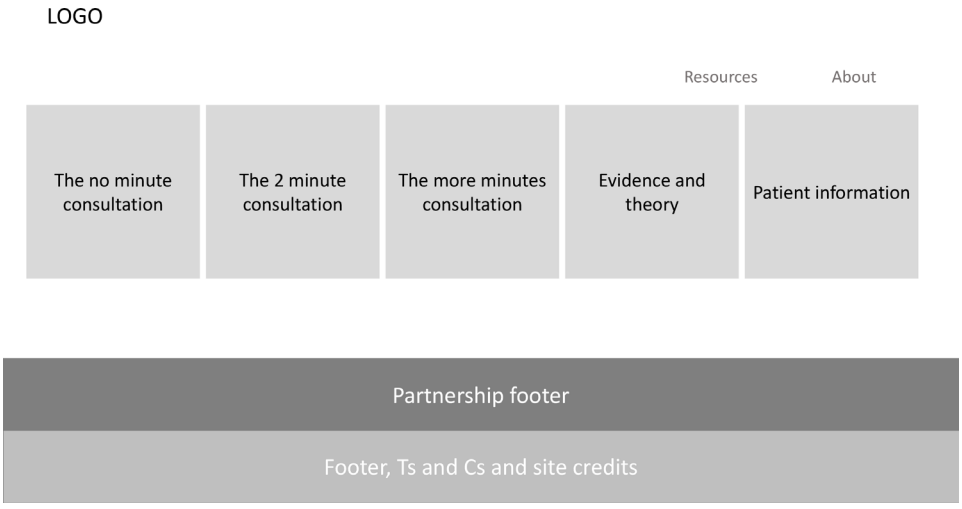

Figure 4 Landing page for the UX-PIN wireframe website.

Table 4 Demographic and professional characteristics of Delphi expert panel

No.	Gender	Professional background	Professional role
1	M	Consultant	Clinical/physical activity academic
2*	F	Pharmacist	Clinical/education
3	F	Physiotherapist	Clinical
4*	M	Consultant	Clinical/physical activity
5	M	Consultant	Clinical
6	F	Academic	Intervention design/health policy
7	F	GP	Clinical
8*	M	Consultant	Clinical/academic
9	M	CEO	Digital communication/ physical activity
10	M	Consultant	Clinical
11*	F	Nurse	Clinical/education
12	F	Midwife	Clinical/education
13	M	Academic	Physical activity researcher
14	M	Consultant	Clinical/academic
15*	F	Psychologist	Behavioural change/health policy

*Did not participate in the second Delphi round.
F, female; M, male.

answering the design-specific questions on the strength of the wireframe website. These issues were rectified and were not ongoing issues for other participants.

We analysed and collated free-text responses thematically (online supplemental file 3). Where free-text responses were relevant but unclear or incomplete, we contacted the respondents by email and, in one case, telephoned to further clarify the meaning. Given the high levels of agreement, free-text responses identified most changes required following round 1. We made the following major changes following round 1:

- Revision of the conversation thread to further encourage patient-led decision making incorporating motivational interviewing theory and focusing on a 'guiding' rather than 'telling' approach.
- Shortening the '2 min' conversation.
- Inclusion of patient-facing outputs for clinicians to hand out.
- Removal of the 'theory and evidence' page in favour of evidence statement 'pop-ups' to make navigation and accessibility more straightforward.
- Inclusion of a pop-up for out-of-date browsers advising software update and optimisation for mobile devices to make usage less reliant on National Health Service (NHS) IT infrastructure.

Delphi round 2

We built a draft website incorporating recommendations from round 1 for testing in round 2 of the Delphi (see figure 5).

Reflecting the high levels of consensus in round 1 of the Delphi (table 5), we dropped 10 questions for the second survey. However, despite achieving consensus in round 1, we repeated question 11 because of significant changes to the relevant content due to free-text feedback.

In round 2, 12 consensus areas achieved high agreement, 6 moderate agreement and 1 low agreement. In addition, we observed moderate agreement for navigation, the achievability of content, the physical activity calculator and the signposting of organisations. See online supplemental file 4 for full results.

Delphi round 3

The inclusivity of design elements recorded low agreement (59%) in round 2. Free-text responses demonstrated that this was because the draft website only included one image. We did this intentionally to reduce build complexity at the draft stage. Ultimate plans were for a socioethnically diverse photograph carousel to feature in the final site, but we did not share this detail with respondents through oversight. We informed respondents of this solution by email, who were satisfied with the approach, and we did not need to proceed to a formal third round of the Delphi.

We revised the website following the amendments suggested in round 2. We then shared the website with the Delphi participants via email, inviting them to comment on the revisions. We received no further comments.

External review

After completing the Delphi study, we distributed the website to the predetermined external review groups. We invited feedback via open comments by email. Responses were unanimously positive, and no content changes were recommended. We received advice on launch, dissemination and engagement.

DISCUSSION

This mixed-methods study represents a unique effort to understand and address the requirements of healthcare professionals and people living with health conditions regarding conversations on physical activity in clinical practice. Results from an extensive preparatory phase, including scoping review and workshops, informed the development of an open-access online resource developed iteratively with expert Delphi consensus. The resultant resource combines published evidence, consensus opinion and practical advice from clinical specialists in a time-sensitive, person-centred, practical format to bridge the gap between evidence and clinical practice.

Codesign

Despite convincing evidence and numerous national guidelines defining the vital role of physical activity across UK healthcare,[1–3 11 21 43–45] the translation of knowledge from research to clinical practice remains limited across professional disciplines.[14–18 21 46] To address this, we employed codesign principles, which 'offers the chance for clinicians to reconsider the purposes of medicine and

Table 5 Overview of Delphi consensus results

No.	Question	Round 1			Round 2	
		% agreement	Any disagreement?	Consensus criteria met?	% agreement	Satisfactory agreement?
1	The information is laid out in a coherent manner that supports clinical consultation	77	Yes	No	83	Yes
2	Using patient quotes is an engaging way to make the content clinically meaningful	86	Yes	No	85	Yes
3	Navigation of the resource is straightforward	79	Yes	No	77	Yes
4*	The theory and evidence page contains a satisfactory amount of educational information	85	No	Yes	82	Yes
5	Presenting the options 'no minutes consultation', '2 min consultation', and 'more minutes consultation' is a useful approach for the busy clinician	94	No	Yes		
6	The menu page makes it clear what to expect from the resource	77	Yes	No	77	Yes
7	The 'no minutes consultation' contains the most important messages for a healthcare professional to share in a very short space of time	85	No	Yes		
8	The 'no minutes consultation' page includes an appropriate amount of information	85	Yes	No	75	Yes
9	The '2 min consultation' contains appropriate information	91	No	Yes		
10	Covering these objectives is achievable in a 2 min consultation	80	Yes	No	77	Yes
11†	The subheadings of the more minutes consultation (ask, share benefits, explain how it works, address concerns, plan and next steps) clearly signpost the content of each page	91	No	Yes	87	Yes
12	The four questions provide useful prompts for eliciting a patient-focused physical activity history	91	No	Yes		
13	The 'physical activity vital sign' is a useful screening tool for a brief intervention in physical activity	83	Yes	No	78	Yes
14	It is useful to present symptom reduction as primary benefits and prevention of further morbidity as secondary benefits	87	No	Yes		
15	It is necessary to display individual references at the bottom of the benefits page in addition to a clear link through to an explanation of the evidence with references on the 'evidence and theory' page	82	Yes	No	83	Yes
16	The positive/negative cycle of activity graphics will help healthcare professionals explain to their patients how physical activity will benefit their symptoms	91	No	Yes		
17	This information is presented in a clinically meaningful way	79	Yes	No	85	Yes
18	Key safety messages, such as addressing cardiac risk, are adequately addressed and explained	86	No	Yes		
19	This is a logical sequence of questions to support individualised physical activity prescription	82	Yes	No	87	Yes
20	'Building activity into all aspects of daily life' is an appropriate premise on which to base physical activity prescription	95	No	Yes		
21	'General Practice, the local social prescribing network, and county sports partnerships' are important organisations to signpost for further support	83	Yes	No	77	Yes
22	Do you have any suggestions for other national physical activity providers or resources we should signpost?	Freetext response				
23	Please arrange the following by the importance of including them in a patient information leaflet – drag and drop each component to your preferred position	Free-text response				

Continued

Table 5 Continued

No.	Question	Round 1 % agreement	Round 1 Any disagreement?	Round 1 Consensus criteria met?	Round 2 % agreement	Round 2 Satisfactory agreement?
24	Do you have any recommendations/comments for the patient information section?	Free-text response			Freetext response	
25	The general 'look and feel' of the designed pages make the resource:					
	(A) Credible	81	Yes	No	83	Yes
	(B) Distinctive	82	Yes	No	81	Yes
	(C) Inclusive	79	Yes	No	59	No
	(D) Energetic	82	Yes	No	81	Yes
26	The design helps discriminate between different types of information, for example, core content and patient quotes	81	Yes	No	82	Yes
27	The design helps prioritise information	87	Yes	No	82	Yes

Statements meeting consensus criteria are coloured green and statements not meeting agreement are coloured red.
*Question 4 was included in round 2 despite meeting agreement criteria because we changed the mechanism for delivering the evidence statements.
†Question 11 was asked again in round 2 despite meeting agreement criteria because the subheadings changed.

for patients and other stakeholders to have their voices heard and respected'.[47] We listened to a wide range of healthcare professionals and patients to understand clinical practice requirements.[27] We interpreted this in the context of published evidence and recommendations to make a draft solution that we tested and refined through the Delphi study. This iterative, user-centric approach enabled us to create a novel person-centred solution designed to adapt to day-to-day practice challenges that are not just scientifically right but also responsive to real

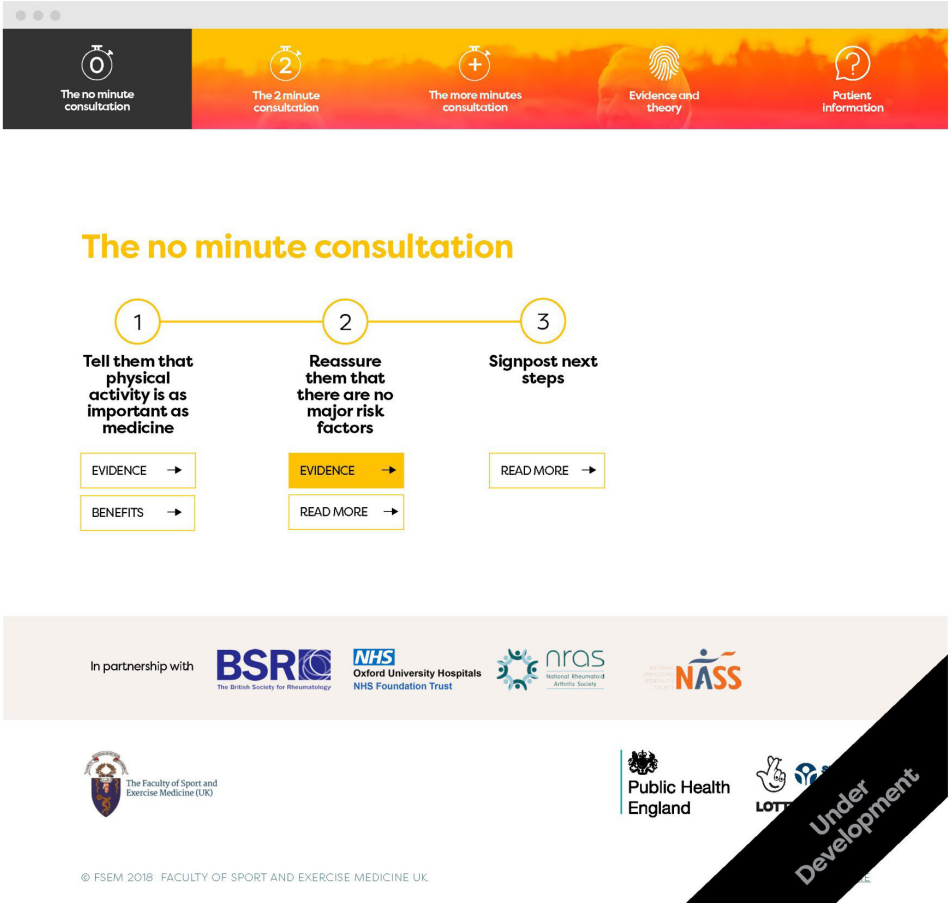

Figure 5 Condition-specific landing page for a 0 min conversation on the draft website for phase 2.

life.[48] Our resource will help address the lack of tools and training opportunities on physical activity counselling for staff in the NHS and elsewhere.[18 22]

Undertaking codesign is challenging. We worked hard on finding a balance between the development of the delivery mechanism alongside the evolution of the content. At times, this confused participants and led to mixed survey responses. A strength of the Delphi process was the ability to gain clarity and consensus on a wide range of options taking into account various individual opinions.[30]

Structuring information

Integrating a design team from the outset enhanced the design process, helping make sense of feedback and translating it into functional solutions. For example, time is an ever-present barrier to conversations on physical activity,[23 49 50] and user groups recommended addressing this barrier at the outset of a resource designed to support clinical practice. The Delphi group recommended a time-based approach on conversations templates of 1, 5 and more minutes, reflecting behavioural change approaches recommended by the National Institute for Health and Care Excellence (NICE)[10] and other physical activity initiatives.[21] Working through solutions to this with the design team enabled the production of practical solutions that we then tested and refined through the Delphi process.

Given the long list of components required by clinicians (table 2), we were unclear on how to prioritise information. Although a novel approach to conversational design, ranking systems are a recommended and successfully used tool in Delphi studies.[51 52] We used a drag and drop mechanism to develop a practical conversation sequence combining all the workshop groups' requirements, and a web-based solution helped us deliver on all aspects.[6 53]

The overwhelming volume of evidence around physical activity in the management of long-term conditions can present an imposing barrier to the practice of evidence-based medicine.[54] Information is understood and retained better when delivered in small chunks following sound design principles.[55 56] A web platform enabled the refinement of a system capable of publishing information in layers to address these two factors. An example was moving the supporting evidence base from long-text format to 'pop-ups' on the strength of Delphi feedback.

The Delphi group reinforced the importance of getting the wording right for a conversation guide to move away from a 'telling' language style and meet the healthcare requirements identified in the consultation phase. A traditional didactic style of consultation runs the risk of 'victim blaming' and fails to support successful behavioural change.[48] This shift in approach can also help healthcare practitioners foster supportive relationships and facilitate improvements in care delivery, benefitting users outside the realm of conversations on physical activity.[57]

Limitations

The Delphi group's skill mix ensured a balance of clinical, behavioural and academic input. However, the group did not represent all healthcare practitioners, potentially limiting the resource's usefulness for unrepresented groups such as social prescribers. In addition, consultation was only undertaken with two groups of medical specialists. Therefore, it is possible that the structure developed to suit autoimmune rheumatic disease and musculoskeletal pain does not best support conversations in other long-term conditions. As a UK-focused study, we reviewed clinical guidelines published in English, but this may reduce applicability to global healthcare environments. We do not know if searching published manuscripts and clinical guidelines in other languages would have generated additional insights or messages that would have impacted this work.

Survey fatigue is an inherent risk of Delphi studies and may explain participants' observed dropout rate through the rounds.[28] Removing 10 questions for the second round had a minimal impact on the average completion time, which changed from 32 min in round 1 to 28 min in round 2. This may reflect that users put aside 30 min to fill out the questionnaire or that the 10 respondents who completed round 2 were more committed to giving feedback on the project. Despite being lower than the average reported dropout rate in Delphi studies,[28] the loss of five participants limited the range of opinions contributing to round 2. Dropout risks regression to the mean and may have contributed to the very high agreement levels seen in round 2.[29]

Future research should seek to test the resources developed during this study to determine efficacy, understand implementation strategies and help improve the format and function of resources to better support conversations on physical activity in the management of long-term conditions. In addition, future Delphi studies focusing on similarly complex topics may benefit from recruiting a larger panel.

CONCLUSION

This mixed-methods study represents a unique effort to understand and address the requirements of healthcare professionals and people living with health conditions to improve their conversations on physical activity. The preparatory phase identified limited time, a lack of knowledge around physical activity and low confidence in behaviour change skills as fundamental challenges for healthcare professionals. Addressing these requirements, the Delphi phase led to the development of a resource offering '1-minute', '5-minute' and 'more minute' person-centred and evidence-based conversation templates for healthcare professionals. The resource is now freely available online at www.movingmedicine.ac.uk.

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