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Building Researcher Capacity for Patient Engagement in Patient-Centered Outcomes Research: A Mixed-Methods Pilot Evaluation of PREPARE

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Abstract

Patients and members of the public can improve health research by sharing their lived experience and helping researchers make studies more relevant and useful. Researchers, however, may not always have practical training in how to work with patients as research partners. We developed PREPARE, a training program designed to help researchers build these skills. We first interviewed 16 researchers and surveyed researchers across several academic and health-system settings to understand their experiences, learning needs, and preferences for training. Patient partners and other stakeholders helped refine the needs assessment and shape the training. We then developed two interactive workshops that combined practical examples, case discussions, and teaching with patient experts. Twenty-one people attended the pilot workshops. Most had not previously received formal training in patient engagement, and participants generally rated the workshop structure and delivery positively. Self-reported confidence was higher after the workshop sessions. Because this was a small pilot and participants were assessed only immediately after training, we do not know whether these changes lasted or changed how researchers later worked with patient partners. PREPARE provides an example of how institutions can use local needs and patient-partner input to develop practical researcher training and ongoing support for meaningful patient engagement.

Plain English Summary

Patients and members of the public can improve health research by sharing their lived experience and helping researchers make studies more relevant and useful. Researchers, however, may not always have practical training in how to work with patients as research partners. We developed PREPARE, a training program designed to help researchers build these skills. We first interviewed 16 researchers and surveyed researchers across several academic and health-system settings to understand their experiences, learning needs, and preferences for training. Patient partners and other stakeholders helped refine the needs assessment and shape the training. We then developed two interactive workshops that combined practical examples, case discussions, and teaching with patient experts. Twenty-one people attended the pilot workshops. Most had not previously received formal training in patient engagement, and participants generally rated the workshop structure and delivery positively. Self-reported confidence was higher after the workshop sessions. Because this was a small pilot and participants were assessed only immediately after training, we do not know whether these changes lasted or changed how researchers later worked with patient partners. PREPARE provides an example of how institutions can use local needs and patient-partner input to develop practical researcher training and ongoing support for meaningful patient engagement.

1. Background

Patient engagement in research refers to the inclusion of patient partners as active contributors throughout the research process [1–5] and can improve the relevance, quality, and impact of research by aligning study questions and outcomes with the needs and lived experiences of those most affected by health conditions.[1, 5–10] Meaningful implementation, however, requires training in the fundamentals of patient engagement and patient-centered outcomes research.[1, 2, 4, 7, 11–15] Current literature identifies researcher training as both a necessary facilitator and a persistent barrier to meaningful engagement.[5, 10, 16] Structured, experiential approaches can improve researchers' awareness, knowledge, confidence, and commitment, but common barriers include time constraints, fear of conflict, unclear expectations, and difficulty selecting appropriate engagement modalities.[1, 10–12, 17–20] Training needs also vary by discipline and expertise, underscoring the need for co-learning and trust-based support for patient-researcher collaboration.[1, 2, 4, 8, 11, 21–23]

Evidence further suggests that hands-on learning, inclusion of patient voices in training, and flexible virtual or hybrid delivery can strengthen skills, increase relevance, and improve access to patient-engagement training.[13, 17–21, 24] Together, these findings support models that are interactive, relationship-centered, co-taught with stakeholders, and responsive to logistical constraints.[12, 19, 20, 24–27]

Existing initiatives have sought to build capacity for patient-oriented research through experiential workshops, online learning, and training programs that prepare patients and researchers for collaborative roles.[18–21, 26, 28–30] These initiatives demonstrate that preparation, role clarity, and supportive infrastructure can strengthen patient-researcher collaboration and influence research processes and outputs. However, existing approaches vary substantially in intended audience, intensity, delivery format, and connection to continuing institutional engagement support. Less is known about brief training models that begin with a local mixed-methods assessment of researcher needs, incorporate patient-partner input, and connect participants with ongoing engagement infrastructure. Addressing this gap is important because researcher preparedness is an enabling condition for generating evidence that reflects patient priorities, experiences, and outcomes.

The objective of this study was to develop, implement, and evaluate PREPARE (EmPowering Researchers to Engage Patients in Research), a pilot patient-engagement training program informed by a sequential mixed-methods needs assessment. Specifically, we identified researcher learning needs, used those findings and patient-partner input to develop PREPARE, and evaluated the program's feasibility, acceptability, and short-term association with self-reported confidence.

2. Methods

2.1. Study Design and Setting

This sequential mixed-methods study comprised three phases: (1) qualitative interviews, (2) a cross-sectional needs assessment survey, and (3) development and pilot evaluation of PREPARE (Fig. 1). Integration occurred sequentially: qualitative findings informed development of the survey, and findings from both needs-assessment phases informed the content, format, and delivery of the training. The study was conducted within an academic health institution with an established Patient Engagement Studio, which provides infrastructure for researcher-patient consultation and collaboration.[31] The study

was conducted from July 2023 through December 2024. Qualitative interviews were conducted from October 2023 to December 2023, the needs assessment survey was administered from December 2023 to March 2024, and the PREPARE workshops were delivered in October 2024.

Interviews were conducted remotely by videoconference, and workshops were offered in hybrid format with in-person and virtual participation. Interview participants received $30, needs assessment respondents received a $5 gift card, and workshop participants received $50 for participating in the training and evaluation. The University of South Carolina Institutional Review Board determined the project to be exempt (Protocol No. Pro00129024), and all participants provided informed consent. Reporting of the qualitative component was informed by the Consolidated Criteria for Reporting Qualitative Research, and mixed-methods reporting was informed by the Good Reporting of a Mixed Methods Study recommendations.[32, 33]

2.2. Patient and Public Involvement and Engagement

The aim of patient and public involvement and engagement was to ensure that the needs assessment and training were relevant, practical, and informed by lived experience. Patient and public involvement and engagement was embedded throughout PREPARE. A 9-member advisory board comprising patient experts, clinicians, and academic researchers refined the needs assessment tools, advised on recruitment, reviewed preliminary findings, and contributed to decisions about workshop content and format. Patient experts did not participate in line-by-line coding of interview transcripts but reviewed preliminary findings and contributed to their interpretation and translation into the survey and training curriculum. Patient experts also co-facilitated the training, bringing lived experience into case discussions and instructional activities. A patient expert contributed to the development, interpretation, writing, and review of this manuscript as a coauthor. The completed GRIPP2 Short Form checklist is provided as Additional file 2.

2.3. Needs Assessment

We conducted semi-structured interviews with 16 researchers to explore their experiences, perceptions, barriers, facilitators, and learning needs related to patient engagement. Participants were recruited using purposive sampling to ensure representation across disciplines, research roles, and levels of experience with patient engagement. Eligible participants were investigators who had previously engaged patients in research through collaboration with the Patient Engagement Studio (PES), with at least 10% protected time for research, an active research portfolio, and an affiliation with an academic institution, academic health sciences center, or academic medical system. Of 70 researchers approached, 16 agreed to participate.

Interviews were conducted by a graduate research assistant trained in qualitative interview methods, who did not have prior professional relationships with participants. Interviews were conducted using MS Teams, lasted approximately 20–50 minutes, and were audio-recorded and transcribed verbatim. The interview guide was informed by prior literature on barriers, facilitators, and training needs in patient-engaged research, as well as advisory-board input.

Thematic analysis of these interviews (Table 1) identified key focus areas that directly informed the design of a subsequent quantitative needs assessment survey. The survey was distributed broadly across institutional researchers to assess awareness, confidence, and training preferences related to patient engagement, ensuring that the PREPARE curriculum addressed both the qualitative themes and the wider community's priorities.

Table 1
Qualitative findings from researcher interviews

Domain	Theme	Summary of Findings	Illustrative Quote
Reflections on PES Consultations – Barriers and Challenges	Institutional Priorities	Competing pressures (grants, publications) limit researchers' ability to prioritize engagement	*"They [institutional figures] care about grant money and publications… engagement can be time-consuming."*
	Patient Engagement Barriers	Diversity, time commitments, and logistics present challenges	*"Finding a group that's adequately diverse and willing to meet regularly is a tall order."*
	Limited Researcher–Patient Interaction	Many researchers have little prior experience engaging directly with patients	*"For a lot of scientists, they have zero patient interaction."*
Reflections on PES Consultations – Facilitators and Impacts	Feedback Integration	PES summaries helped researchers interpret and prioritize patient input.	*"It was really nice that the Studio interpreted what patients said for us."*
	Practice Improvements	Researchers refined instruments, language, and methods based on feedback.	*"I elevated my interview guide to be much more."*
	Capacity Building	Consultations enhanced clinician–researchers' confidence and understanding.	*"It helped to strengthen my understanding as a clinician and researcher."*
Workshop Recommendations – Workshop Content and Format	Interactive Learning	Strong preference for hands-on activities (role-play, observing patient panels).	*"I would attend if there were a lot of activity - role play as participants and presenters."*
	Flexible Delivery Options	Preference for hybrid/virtual formats for accessibility.	
	Asynchronous Opportunities	Interest in self-paced modules and videos.	*"If it were a module where I could go in and watch a video and get information on the Engagement Studio…"*
Workshop Recommendations – Motivation and Scheduling	Peer Inspiration	Seeing colleagues succeed with engagement motivates participation.	*"We have the champion of the Studio down the hall and can see her success."*
	Preferred Duration	Short, discussion-focused segments preferred	*"Three mini sessions in the morning, 30–45 minutes each."*
Marketing & Outreach	Visibility at Key Events	Promote PES at conferences and statewide meetings using PES staff and patient experts.	*"Include someone from PES and a patient expert at state meetings."*
	Target Early-Career Researchers	Post-docs and junior faculty highly motivated and receptive to training.	*"Market to new post-docs—they're the most hungry to get experience."*

2.3.1. Participants and Recruitment.

Invitations to complete the Needs Assessment Survey were sent to 3,095 researchers identified through faculty and staff directories across academic institutions and an academic medical center in the southeastern United States. The sampling frame intentionally included individuals working in basic and bench science, translational research, clinical research, and research involving patients and/or populations – fields in which patient engagement could be directly applied. Of those invited, 193 researchers responded (6% response rate). Respondents primarily represented academic institutions and a large learning health system. Eligibility for analysis required respondents to be actively conducting research, defined as allocating ≥ 10% effort to research activities such as study design, data analysis, and dissemination. Seventy respondents (36%) met this criterion, representing a mix of medicine, nursing, public health, and other applied research areas. These 70 eligible participants served as the analytic sample that informed the PREPARE workshop design. The survey was administered electronically using Qualtrics between December 2023 and March 2024. Invitations were distributed by email, with one reminder email sent approximately two weeks after the first invitation.

2.4. Reported Measures

The needs assessment survey measured researchers' awareness of patient engagement, confidence in engagement-related competencies, interest in training, and preferences for workshop formats and delivery methods. Awareness was assessed through three dichotomous ("Yes/No") items asking whether respondents had previously heard of patient engagement in research, had ever involved patients or community partners as members of a research team, or had ever consulted with patients or community members for research purposes. Self-reported confidence in understanding patient engagement in research was assessed using a five-point Likert scale (1 = not confident at all to 5 = very confident), which was later dichotomized for bivariate analyses. To identify areas of limited knowledge, respondents were asked to select topics for which they felt they had a limited understanding, such as the benefits of patient engagement, methods for involving patients, legal and ethical considerations, and evaluating engagement impact.

Interest in training was measured using Likert-type items assessing respondents' willingness to attend a workshop focused on patient engagement. To inform workshop design, respondents were also asked to indicate specific content areas they wanted included. Delivery preferences were assessed by asking participants to select among virtual, in-person, synchronous, and asynchronous formats, as well as preferred duration and pacing for a three-hour training. Finally, respondents identified potential motivators that would encourage workshop attendance, including funding information, networking

opportunities, continuing education credits, food, and access to free consultation with the PES. The complete needs assessment survey and workshop evaluation instruments are provided in Additional file 1.

2.5. Workshop Design and Implementation

The 2-session PREPARE workshop was developed from interview and survey findings and informed by published engagement frameworks; detailed curriculum content is provided in Additional file 1. The needs assessment survey and workshop recruitment drew from a similar sampling frame comprising researchers across the participating academic institutions and affiliated health system. Workshop participation was not contingent on completing the needs assessment; therefore, the curriculum was informed by aggregate needs identified across the broader researcher population rather than by individualized assessments of workshop attendees. As a developmental pilot emphasizing facilitated discussion, case-based activities, and small-group interaction, enrollment was intentionally limited to approximately 20 participants per session. Because survey and workshop records were not linked, the extent of individual overlap between the needs assessment and workshop samples could not be determined.

2.6. Workshop Evaluation

Participants completed evaluation surveys at three timepoints: before the first workshop (pre-workshop), immediately following the first session, and immediately following the second session. The pre-workshop survey assessed baseline confidence in engaging patients in research using a five-point Likert scale ranging from 1 (“Not confident at all”) to 5 (“Extremely confident”). Post-session surveys included the same confidence item to capture change over time, and additionally asked participants to rate their confidence in performing specific engagement roles, including consulting with patients, involving them, collaborating with them, and having them lead or support aspects of research.

To assess participants’ perceptions of the workshop experience, post-session surveys asked them to rate their satisfaction with several components of each session, including the overall structure and pacing, the speakers’ knowledge, the speakers’ effectiveness at engaging participants, the usefulness of homework exercises, and whether technology supported learning. Satisfaction items used five-point Likert scales with varying anchors depending on the construct being measured (e.g., 1 = “terrible” to 5 = “excellent” for session structure; 1 = “not very effective” to 5 = “extremely effective” for speaker engagement). Participants were asked whether the technology used in the session supported their learning (yes/no/not applicable).

2.7. Data Analysis

2.7.1. Qualitative Analysis.

Semi-structured interview transcripts were analyzed using an iterative thematic analysis approach.[34] One primary coder conducted an initial full review of all transcripts and applied open codes using NVivo qualitative software. To enhance reliability, two additional independent coders each reviewed half of the transcripts and applied codes based on the evolving codebook. Coding outputs from all three coders were then merged, and two additional reviewers examined the combined codes and preliminary themes for coherence and completeness. Finally, the first and last authors reviewed all coded data and thematic structures, resolving discrepancies through discussion until consensus was reached. This multi-stage analytic process ensured rigor and produced the final thematic findings that informed the development of the quantitative needs assessment survey.

Investigator triangulation was incorporated through independent coding and review by multiple analysts followed by consensus discussion. Several members of the research team had expertise in patient engagement and affiliations with the Patient Engagement Studio; the team recognized that these experiences could shape data interpretation. Involving multiple analysts and reviewing disagreements through consensus allowed differing perspectives to be considered throughout analysis.

2.7.2. Quantitative Needs Assessment Analysis.

Descriptive statistics summarized survey responses, with frequencies and percentages reported for categorical variables and means with standard deviations (SD) for continuous variables. Bivariate analyses were conducted using chi-square tests for categorical variables, two-tailed t-tests assuming unequal variance for continuous engagement-related confidence scores, and one-way ANOVA to compare mean confidence scores across disciplinary groups. All quantitative analyses were conducted in Microsoft Excel.

2.7.3. Workshop Evaluation Analysis.

Evaluation data from the PREPARE training sessions were analyzed descriptively. Pre–post comparisons of participant self-reported confidence and perceived value were conducted, and scores were also compared between Sessions 1 and 2. Given the small sample size and limited cell counts, no statistical significance testing was performed; instead, results are presented as descriptive trends to illustrate changes in participant perceptions and learning outcomes.

2.8. Use of Generative Artificial Intelligence

ChatGPT (OpenAI, San Francisco, CA, USA) was used during manuscript preparation to assist with language editing, restructuring, and drafting revisions. It was not used for data collection or data analysis. All substantive interpretations, conclusions, and final manuscript content were reviewed and approved by the authors, who take full responsibility for the work.

3. Results

3.1. Qualitative Needs Assessment Findings

Interviews identified barriers to patient engagement, perceived benefits of engagement support, and preferences for researcher training (Table 1). Participants described competing institutional priorities, logistical and diversity-related challenges, and limited opportunities for direct interaction between researchers and patients. At the same time, researchers reported that patient-engagement consultations helped them interpret patient feedback, refine study materials and methods, and strengthen their confidence and understanding of engagement practices.

Participants favored practical and interactive training, including opportunities to observe or practice patient engagement. Flexible hybrid or virtual delivery, shorter sessions, asynchronous options, peer examples, and outreach to early-career researchers were also identified as potentially useful strategies for increasing participation.

3.2. Needs Assessment Survey Results

Survey respondents represented multiple disciplines and research areas, with the largest groups from public health (32%), medicine (28%), and nursing (17%) (Table 2). Most respondents (78%) had heard of patient engagement, but only 56% had previously consulted with patients for research purposes, suggesting a gap between awareness and practice. More than half reported low confidence in their understanding of patient engagement (mean = 3.1, SD = 1.2), while those with prior consultation experience reported higher confidence than those without it (mean = 3.3 vs 2.7; $p = 0.04$).

Table 2
Needs assessment results by engagement experience and discipline (N = 70)

	Total		Consult with Patients					Discipline								
	N = 70		Yes		No		p-Value	Medicine		Nursing		Public Health		Other		p-Value
								N = 18 (28%)		N = 11 (17%)		N = 21 (32%)		N = 15 (23%)		
Variable Name	**n**	**%**	**n**	**%**	**n**	**%**		**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
Involved patient(s) in research																
Yes	24	38.1%						4	28.6%	4	36.4%	9	45.0%	7	46.7%	
No	39	61.9%						10	71.4%	7	63.6%	11	55.0%	8	53.3%	
Consult with patient(s) for research																
Yes	35	55.6%						4	28.6%	6	54.5%	15	75.0%	9	60.0%	
No	28	44.4%						10	71.4%	5	45.5%	5	25.0%	6	40.0%	
Heard of patient engagement before survey							**0.09**									
Yes	49	77.8%	30	85.7%	19	67.9%		9	64.3%	9	81.8%	18	90.0%	11	73.3%	
No	14	22.2%	5	14.3%	9	32.1%		5	35.7%	2	18.2%	2	10.0%	4	26.7%	
	n	MEAN (SD)	n	MEAN (SD)	n	MEAN (SD)										
Self-reported confidence in understanding patient engagement in research (numeric score)	63	3.1(1.2)	35	3.3(1.2)	28	2.7(1.8)	**0.04**	14	2.6(1.2)	11	3.5(0.8)	20	3.3(1.4)	15	3.1(2.1)	
Self-reported confidence in understanding patient engagement in research (categorical)							**0.46**									
Not confident or slightly/somewhat confident	35	55.6%	18	51.4%	17	60.7%		11	78.6%	5	45.5%	10	50.0%	7	46.7%	
Moderately or very confident	28	44.4%	17	48.6%	11	39.3%		3	21.4%	6	54.5%	10	50.0%	8	53.3%	
Interest in attending workshops							**0.17**									
Not, slightly, or moderately interested	43	71.7%	22	64.7%	21	80.8%		11	84.6%	8	72.7%	12	66.7%	9	60.0%	
Very or extremely interested	17	28.3%	12	35.3%	5	19.2%		2	15.4%	3	27.3%	6	33.3%	6	40.0%	
Topics interested in learning more about*	54															
Methods for involving patients in research	38	70.4%	23	65.7%	15	53.6%		9	52.9%	6	54.5%	12	57.1%	8	53.3%	
Legal/Ethical Considerations	31	57.4%	18	51.4%	10	35.7%		7	41.2%	5	45.5%	7	33.3%	6	40.0%	
Overcoming challenges	31	57.4%	19	54.3%	12	42.9%		7	41.2%	8	72.7%	11	52.4%	4	26.7%	

	Total		Consult with Patients					Discipline								
	N = 70		Yes		No		p-Value	Medicine		Nursing		Public Health		Other		p-Value
								N = 18 (28%)		N = 11 (17%)		N = 21 (32%)		N = 15 (23%)		
Variable Name	**n**	**%**	**n**	**%**	**n**	**%**		**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
Grant requirement	20	37.0%	12	34.3%	8	28.6%		5	29.4%	5	45.5%	5	23.8%	5	33.3%	
How to write PE	19	35.2%	13	37.1%	7	25.0%		2	11.8%	3	27.3%	6	28.6%	8	53.3%	
Evaluating impact	19	35.2%	9	25.7%	10	35.7%		2	11.8%	8	72.7%	3	14.3%	4	26.7%	
Academic journal requirement	13	24.1%	9	25.7%	5	17.9%		2	11.8%	3	27.3%	5	23.8%	3	20.0%	
Benefits of PE	7	13.0%	1	2.9%	6	21.4%		2	11.8%	3	27.3%	1	4.8%	0	0.0%	
Other	2	3.7%	1	2.9%	1	3.6%		1	5.9%	0	0.0%	1	4.8%	0	0.0%	
Ideal Format*	55															
Virtual	35	63.6%	22	62.9%	13	46.4%		5	29.4%	8	72.7%	9	42.9%	11	73.3%	
In-person	15	27.3%	10	28.6%	5	17.9%		2	11.8%	3	27.3%	7	33.3%	3	20.0%	
Synchronous delivery	24	43.6%	15	42.9%	9	32.1%		2	11.8%	5	45.5%	8	38.1%	7	46.7%	
Asynchronous delivery	22	40.0%	10	28.6%	12	42.9%		5	29.4%	2	18.2%	7	33.3%	5	33.3%	
How long willing to participate	58						**0.02**									**(**
Less than 1 hour	11	19.0%	8	23.5%	3	12.5%		1	7.7%	4	40.0%	2	11.1%	2	14.3%	
1–2 hours	29	50.0%	15	44.1%	14	58.3%		8	61.5%	5	50.0%	11	61.1%	5	35.7%	
Half a day (3–4 hours)	11	19.0%	10	29.4%	1	4.2%		2	15.4%	1	10.0%	4	22.2%	3	21.4%	
Full day (5–8 hours)	1	1.7%	0	0.0%	1	4.2%		0	0.0%	0	0.0%	0	0.0%	1	7.1%	
I'm not interested in participating	6	10.3%	1	2.9%	5	20.8%		2	15.4%	0	0.0%	1	5.6%	3	21.4%	
How should workshop be broken up	55						**0.02**									**(**
One, 3-hour training	15	27.3%	13	38.2%	2	9.5%		2	18.2%	5	50.0%	4	22.2%	4	30.8%	
Two, 1.5 trainings	26	47.3%	16	47.1%	10	47.6%		3	27.3%	4	40.0%	9	50.0%	9	69.2%	
Three, 1 hour training	14	25.5%	5	14.7%	9	42.9%		6	54.5%	1	10.0%	5	27.8%	0	0.0%	
What encourage you to come*	55															
Funding Information	33	60.0%	19	54.3%	14	50.0%		7	41.2%	6	54.6%	10	47.6%	8	53.3%	
Networking Opportunities	29	52.7%	19	54.3%	10	35.7%		5	29.4%	4	36.4%	10	47.6%	10	66.6%	
Institutional Support	29	52.7%	16	45.7%	13	46.4%		9	52.9%	2	18.2%	10	47.6%	7	46.6%	
Free consultation with PES	23	41.8%	16	45.7%	7	25.0%		3	17.7%	4	36.4%	8	38.1%	6	40.0%	
Food	22	40.0%	13	37.1%	9	32.1%		4	23.5%	4	36.4%	8	38.1%	5	33.3%	
Continuing Education credits	19	34.5%	9	25.7%	10	35.7%		9	52.9%	6	54.6%	2	9.5%	1	20.0%	
Hands-on activities	15	27.3%	7	20.0%	8	28.6%		4	23.5%	1	9.1%	7	33.3%	2	40.0%	
Other	2	3.6%	2	5.7%	0	0.0%		0	0.0%	1	9.1%	1	4.8%	0	0.0%	

	Total		Consult with Patients			Discipline				
	N = 70		Yes		No	p-Value	Medicine	Nursing	Public Health	Other	p-Value
							N = 18 (28%)	N = 11 (17%)	N = 21 (32%)	N = 15 (23%)	
Variable Name	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
Denominators vary across variables because of item-level nonresponse. Percentages were calculated using the number of respondents completing each ite															
**Multiple responses permitted*															

The most frequently identified learning needs were methods for involving patients in research (70%), legal and ethical considerations (57%), and overcoming challenges (57%). Preferences for training format favored virtual delivery (64%), while synchronous and asynchronous options were similarly endorsed. Funding information was the most commonly reported motivator for attendance, and respondents generally preferred shorter sessions delivered over multiple segments rather than a single extended workshop.

3.3. Workshop Design

PREPARE was developed from the qualitative and survey findings and informed by established engagement frameworks. The 2-session hybrid workshop addressed foundational expectations for partnerships, levels of engagement, implementation strategies, and case-based application (Fig. 2); detailed curriculum content is provided in Additional file 1.

3.4. Workshop Evaluation

A total of 21 participants attended the PREPARE workshop series. Among the 20 participants who completed the pre-workshop survey, 8 (40%) were faculty or researchers, 7 (35%) were graduate students, 4 (20%) were research staff, and 1 (5%) was a patient or patient advocate. Thirteen (65%) reported prior involvement in research that included some form of patient engagement, while 17 (85%) had never received formal training, and baseline confidence was low (mean = 1.9, SD = 0.9).

After Session 1, participants reported improved understanding of foundational expectations for partnerships, levels of engagement, and the Patient Engagement Studio process, with 75% to 85% rating these areas very or extremely well (Table 3). Confidence also increased, with mean confidence rising from 1.85 (SD = 0.88) pre-workshop to 3.55 (SD = 0.94) after Session 1. After Session 2, participants reported strong perceptions of the implementation content and case studies, and confidence remained elevated, with a mean post-session score of 3.67 (SD = 0.66). Most participants rated implementation strategies, question development, and the 10-Step Framework discussion as very or extremely useful or well addressed.

Table 3
PREPARE workshop learning outcomes and confidence measures

Variable Name	Session 1 (n = 20)			Session 2 (n = 21)	
	n	%	Variable Name	n	%
Understand foundational expectations for partnerships in PCOR			**How well the session discussed implementation strategies**		
Not well or slightly well	1	5.0%	Not well or slightly well	1	4.8%
Moderately well	4	20.0%	Moderately well	2	9.5%
Very or extremely well	15	75.0%	Very or extremely well	18	85.7%
Understand levels of patient engagement			**How useful were the case studies**		
Not well or slightly well	1	5.0%	Not or slightly useful	2	9.5%
Moderately well	3	15.0%	Moderately useful	3	14.3%
Very or extremely well	16	80.0%	Extremely useful	16	76.2%
Confidence in discussing foundational expectations			**Confidence in discussing implementation strategies**		
Not or slightly confident	2	10.0%	Not or slightly confident	0	0.0%
Moderately confident	9	45.0%	Moderately confident	9	42.9%
Very or extremely confident	9	45.0%	Very or extremely confident	12	57.1%
Confidence in applying "Consult" level			**Confidence in ability to create clear/simple questions**		
Not or slightly confident	2	10.0%	Not or slightly confident	1	4.8%
Moderately confident	6	30.0%	Moderately confident	8	38.1%
Very or extremely confident	12	60.0%	Very or extremely confident	12	57.1%
Confidence in applying "Involve" level			**Confidence in applying the "Collaborate" level**		
Not or slightly confident	1	5.0%	Not or slightly confident	1	4.8%
Moderately confident	8	40.0%	Moderately confident	8	38.1%
Very or extremely confident	11	55.0%	Very or extremely confident	12	57.1%
Did session help in your understanding of engagement process at PES			**How well did session address importance of creating questions**		
Not or slightly well	0	0.0%	Not or slightly well	3	14.3%
Moderately well	3	15.0%	Moderately well	2	9.5%
Very or extremely Well	17	85.0%	Very or extremely well	16	76.2%
Likelihood of utilizing the PES resources			**How useful was discussing 10-step Framework**		
Extremely or somewhat unlikely	0	0.0%	Not or slightly useful	0	0.0%
Neither likely nor unlikely	3	15.0%	Moderately useful	2	9.5%
Somewhat or extremely likely	17	85.0%	Very or extremely useful	19	90.5%

3.5. Participant Ratings of Session Quality and Instructional Delivery

Participants reported consistently positive perceptions of the PREPARE training sessions across multiple aspects of instructional quality and delivery (Table 4). In both Session 1 and Session 2, the vast majority of respondents rated the overall structure of the session as good or excellent (85% and 95%, respectively), and similar proportions rated the pacing as good or excellent (85% and 86%). Speakers were viewed as highly knowledgeable, with 70% of Session 1 participants and 76% of Session 2 participants rating them as “extremely knowledgeable.” Most attendees also found the speakers to be very or extremely effective at engaging participants (95% in Session 1; 86% in Session 2). Ratings of homework exercises were more mixed, with 50% of Session 1 participants and 57% of Session 2 participants rating them as very or extremely useful. Finally, nearly all respondents agreed that the technology used supported their learning (89% in Session 1; 91% in Session 2), indicating successful delivery across virtual components of the workshop. Overall, participants reported favorable ratings of the training’s structure, pacing, instruction, and technology support, while ratings of the homework exercises were more mixed.

Table 4
PREPARE workshop ratings of session quality and delivery

	Session 1 (N = 20)		Session 2 (N = 21)	
	n	**%**	**n**	**%**
Overall structure of session				
Terrible or Poor	1	5.0%	0	0.0%
Average	2	10.0%	1	4.8%
Good or Excellent	17	85.0%	20	95.2%
Pacing of session				
Terrible or Poor	0	0.0%	0	0.0%
Average	3	15.0%	3	14.3%
Good or Excellent	17	85.0%	18	85.7%
Rating of speakers knowledge				
Very knowledgeable	6	30.0%	5	23.8%
Extremely knowledgeable	14	70.0%	16	76.2%
How effective was speaker at engaging				
Not or slightly effective	1	5.0%	0	0.0%
Moderately effective	0	0.0%	3	14.3%
Very or extremely effective	19	95.0%	18	85.7%
How useful were homework exercises				
Not or slightly useful	3	15.0%	1	4.8%
Moderately useful	7	35.0%	8	38.1%
Very or extremely useful	10	50.0%	12	57.1%
Did technology used support learning				
Yes	16	80.0%	19	90.5%
No	2	10.0%	2	9.5%
N/A	2	10.0%	-	-

4. Discussion

This sequential mixed-methods pilot identified specific researcher learning needs and found short-term increases in self-reported confidence following PREPARE. Qualitative and survey findings highlighted practical barriers to patient engagement and preferences for accessible, applied training, while the workshop evaluation demonstrated favorable participant perceptions of the curriculum and delivery. Given the low needs assessment response rate, small pilot sample, and absence of longer-term follow-up, these findings should be interpreted as evidence of feasibility and acceptability rather than effectiveness. PREPARE's principal contribution is as a needs-informed, patient-partnered approach that links researcher training with ongoing institutional engagement support.

Researcher preparation is an important enabling condition for patient-centered outcomes research because meaningful engagement can influence research questions, study materials, methods, interpretation, and dissemination. Prior work has shown that patient partners can influence activities throughout the research process and that formal preparation, clearly defined roles, and access to engagement resources facilitate more meaningful collaboration.[28, 30] PREPARE extends this literature by illustrating how local qualitative and survey findings can be integrated with patient-partner input to develop brief researcher training linked to continuing institutional support.

4.1. Needs Assessment

Results from our needs assessment reflect similar patterns reported in current patient-oriented research training, which note persistent variability in both preferred delivery formats and the characteristics of individuals who seek out these opportunities.[2, 20, 35, 36] Nearly half of respondents preferred two 1.5-hour sessions and approximately one-quarter preferred three 1-hour sessions, which is consistent with other studies that showed participants preferred shorter sessions at a time.[24] Participants showed a preference for virtual formats, and preferences for synchronous versus asynchronous delivery were evenly split among the participants, indicating no dominant preference for one format over the other. While a large proportion of the researchers surveyed preferred virtual methods, corroborating the benefits of online learning demonstrated elsewhere, learning environments often use blended or hybrid modalities to accommodate diverse needs and constraints.[8, 12, 18, 20, 25–27] The literature indicates that no single format is sufficient for all learners,[20]

necessitating flexible, multilayered approaches.[2, 27] For example, studies confirm variability in preferences for synchronous versus asynchronous training modes, where one group favored synchronous engagement to interact directly and develop communication skills, while another valued asynchronous delivery for flexibility and time to process complex information.[26] Similarly, the adoption of hybrid delivery models is suggested to offer the greatest flexibility and accessibility, especially in constraints related to travel, scheduling, or safety.[18, 25, 27]

4.2. Workshop design

We designed our PREPARE training curriculum with two synchronous training sessions and asynchronous pre-work to build researcher capacity for meaningful, patient-centered engagement through practical, interactive learning. Participants showed strong support for the hybrid and synchronous delivery models. High satisfaction with the structure of the program and the speakers within our training aligns with previous studies on training modalities.[25, 26, 37, 38] Previous research also shows evidence of the effectiveness of online/virtual training and workforce development in patient-centered outcomes research, as studies evaluating/comparing in-person, asynchronous, and virtual synchronous training programs for researchers have reported overall satisfaction and knowledge development.[13, 26, 37, 38] Additionally, the convenience of online training programs increases participation and improves the learners' experience, which aligns with our study findings.[13, 18, 24, 25]

Incorporating case studies and hearing a first-hand account from patient experts served as the "hands-on" learning component of our curriculum. Previous works have also combined a general introduction of patient engagement concepts and application-based activities to help contextualize how researchers use this information in practice.[12] This incorporation of experiential learning, as well as the presence of patient co-instructors, can improve participant satisfaction and training experience.[19, 24] Including patients in the training and facilitating direct discussion with them helps to provide a renewed perspective and increase relevance and perceived value.[27] Furthermore, learning from the challenges faced by the researchers actively working in the patient engagement space can enhance experiential learning.[18]

Although participants were generally satisfied with the training, one reported internet-access difficulties that affected participation. Similar technology and logistical challenges have been reported in virtual training literature.[25–27] Hybrid delivery may reduce geographic and scheduling barriers, but accessibility should not be assumed; future implementation should consider digital access, scheduling, accommodation needs, compensation, and representation of researchers who may face barriers to training participation.

4.3. Workshop Evaluation

The workshop evaluation showed increased confidence in engaging with patients, consistent with prior studies reporting short-term gains in understanding and knowledge after patient-engagement training.[20, 24] Participants also reported a high likelihood of using PES resources in the future, suggesting interest in continued institutional engagement support. Brief, skills-focused training may help address common barriers to engagement, including limited knowledge, process uncertainty, and fear of doing it "wrong."[10, 18–20, 24, 35] When researchers gain clearer expectations and practical examples, they may be more willing to initiate or sustain partnership activities.[4, 10, 12, 25] Early positive exposure may also shift perceptions of feasibility and support a broader culture of engagement within academic settings.[10, 16] Participants' intention to use available engagement-support resources highlights the potential importance of institutional infrastructure in supporting engagement beyond a one-time training event.[7, 10, 12, 16, 21, 23] However, intention to use these resources should not be interpreted as evidence of sustained behavior change or program effectiveness.

The workshops also provided a shared learning environment in which researchers could discuss challenges, observe examples of patient partnership, and engage in applied problem-solving, all of which are associated with stronger engagement capacity, peer support, and deeper learning.[12, 21, 23, 38] Experiential learning and peer interaction may be particularly valuable for developing relational and collaborative research skills.[12, 19, 38] Although outcomes were limited to the short term, the combination of increased confidence and expressed intention to seek institutional support suggests that training may help strengthen engagement practices and build more sustainable engagement cultures over time.[12, 18, 22] Dedicated training may also support broader organizational capacity by helping address misalignment between academic incentives and the real-world value of engaged research.[12, 21]

4.4. Strengths and limitations

This study has several limitations. First, the 6% needs assessment response rate creates substantial potential for nonresponse and self-selection bias; respondents may have been more interested in patient engagement than nonrespondents. Accordingly, the survey findings should be interpreted as identifying priorities among respondents rather than estimating the prevalence of training needs across the broader institutional research workforce. Second, although the needs assessment survey and workshop recruitment drew from a similar sampling frame of researchers across participating academic institutions and an affiliated health system, workshop participation was not contingent on completing the needs assessment. The curriculum was therefore based on aggregate priorities identified across the broader researcher population and may not have reflected the prior experience or learning needs of every workshop attendee.

Third, workshop enrollment was intentionally limited to approximately 20 participants per session to facilitate discussion, experiential activities, and small-group interaction. Although appropriate for a developmental pilot, the small sample limits generalizability, statistical power, and assessment of differences across participant subgroups. Fourth, workshop outcomes were self-reported and assessed immediately after each session without a comparison group or longer-term follow-up. We therefore could not determine whether increases in confidence were sustained or translated into changes in researcher behavior, the quality of patient engagement, or patient-centered research outcomes. Some evaluation items also used different response anchors across constructs, which may have affected interpretation and comparability of responses.

Finally, the multidisciplinary sampling strategy supported development of a broadly applicable foundational curriculum but may have obscured discipline-specific training needs. Limited information about participants' career stage and sociodemographic characteristics also restricted our ability to assess

representativeness, equity, and whether training experiences differed across researcher groups. Although patient partners contributed across multiple study phases, we did not conduct a formal evaluation of patient and public contributors' experiences or systematically collect potential negative effects of involvement.

Despite these limitations, the study had several strengths. The sequential mixed-methods design enabled qualitative findings to inform the survey and allowed findings from both needs-assessment phases to guide curriculum development. PREPARE was also developed with patient and stakeholder input, incorporated patient experts into workshop delivery, and was embedded within existing institutional engagement infrastructure. These features support the feasibility of a needs-informed, patient-partnered approach to researcher training while underscoring the need for more rigorous evaluation of sustained behavioral and research-level outcomes.

4.5. Future directions

Future work should evaluate PREPARE at larger scale and across more diverse researcher groups while examining whether different delivery formats produce comparable outcomes. Although participants responded positively to synchronous, interactive training, variation in preferences for structure and timing suggests that flexible models may be needed across institutional contexts. Adapting PREPARE into modular or asynchronous formats and comparing these with the synchronous model could clarify how delivery modality influences knowledge, confidence, self-efficacy, and longer-term uptake of patient-engagement practices while addressing challenges related to scalability, geographic reach, and time constraints.

Future evaluations should also assess whether training produces sustained changes in researcher behavior, including the involvement of patient partners in research question development, grant preparation, study design, conduct, interpretation, and dissemination. Evaluations should include more diverse participants, longer follow-up, and measures of the quality and influence of engagement on research decisions and patient-centered outcomes.

5. Conclusions

In this pilot mixed-methods study, a needs-informed, patient-partnered training program was feasible to deliver and was associated with short-term increases in self-reported confidence in patient engagement. PREPARE illustrates one approach to linking brief researcher training with ongoing institutional engagement infrastructure to support patient-centered outcomes research. Larger and more diverse studies with longer follow-up and measures of actual engagement behavior are needed to determine whether short-term confidence gains translate into sustained changes in research practice and outcomes.

Abbreviations

ANOVA
analysis of variance
IRB
Institutional Review Board
PCOR
patient-centered outcomes research
PES
Patient Engagement Studio
PREPARE
EmPowering Researchers to Engage Patients in Research
SD
standard deviation.

Declarations

Ethics approval and consent to participate

This project was reviewed by the University of South Carolina Institutional Review Board and determined to be exempt (Protocol No. Pro00129024). All participants provided informed consent before participation.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Author Contribution

NN and ABK conceptualized the study, obtained funding, and supervised the project. MP, ANe, AM, ANo, and SB contributed to methodology, data collection, and project administration. ANe, AM, NN, and ABK conducted the qualitative analysis. NN and ANe conducted the quantitative analysis. JF contributed to instrument refinement, curriculum development, interpretation, and manuscript review. NN, MP, ANe, SB, RR, TJ, FA, JF, and ABK contributed to drafting the manuscript. All authors read and approved the final manuscript.

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Data Availability

Deidentified data from the needs assessment and workshop evaluation, including qualitative interview summaries and survey data, are available from the corresponding author upon reasonable request. Raw interview transcripts and materials that could compromise participant confidentiality are not publicly available. Access is subject to review of a methodologically sound proposal and, when applicable, execution of a data use agreement.

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Figures

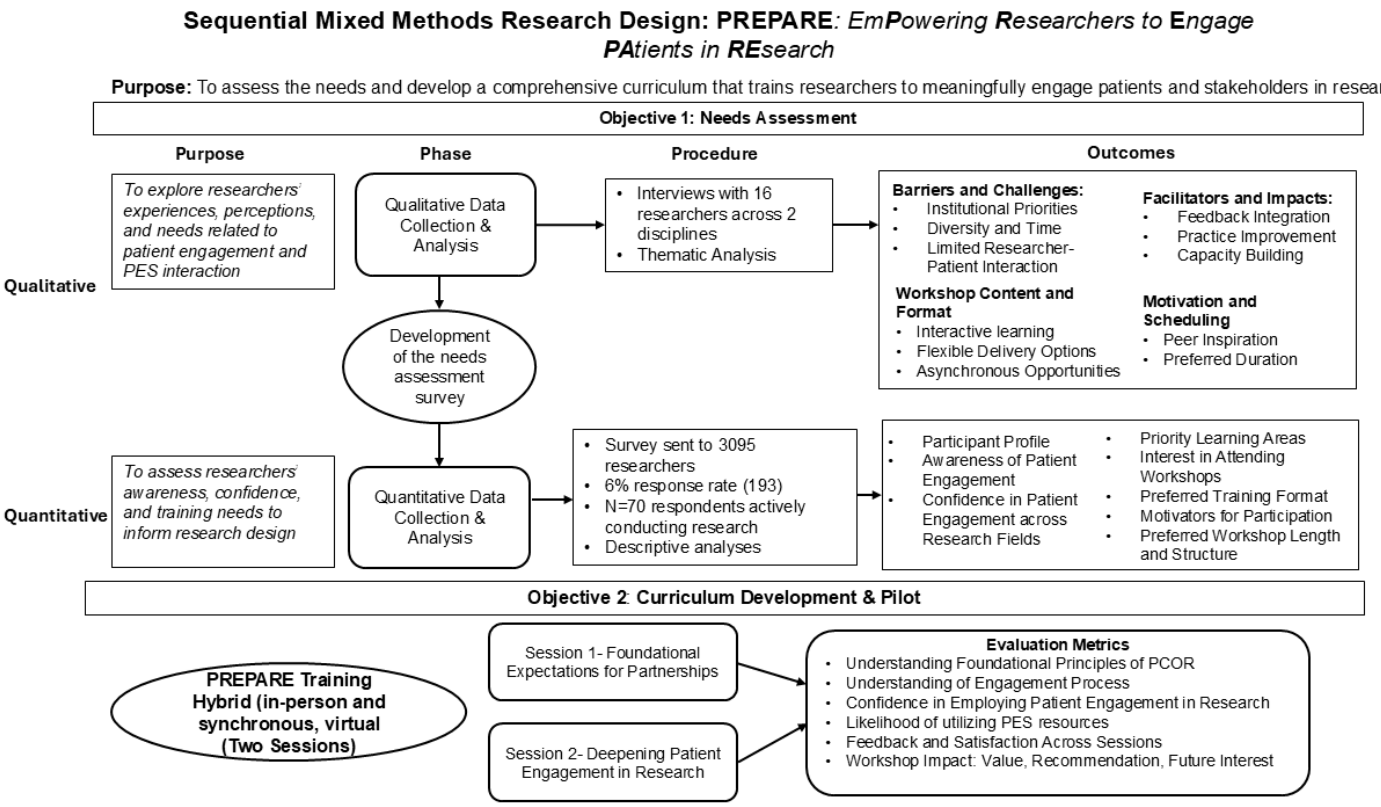


Figure 1

Sequential mixed-methods design of PREPARE. Qualitative interviews informed the needs assessment survey, which subsequently informed development and pilot evaluation of the PREPARE training program.

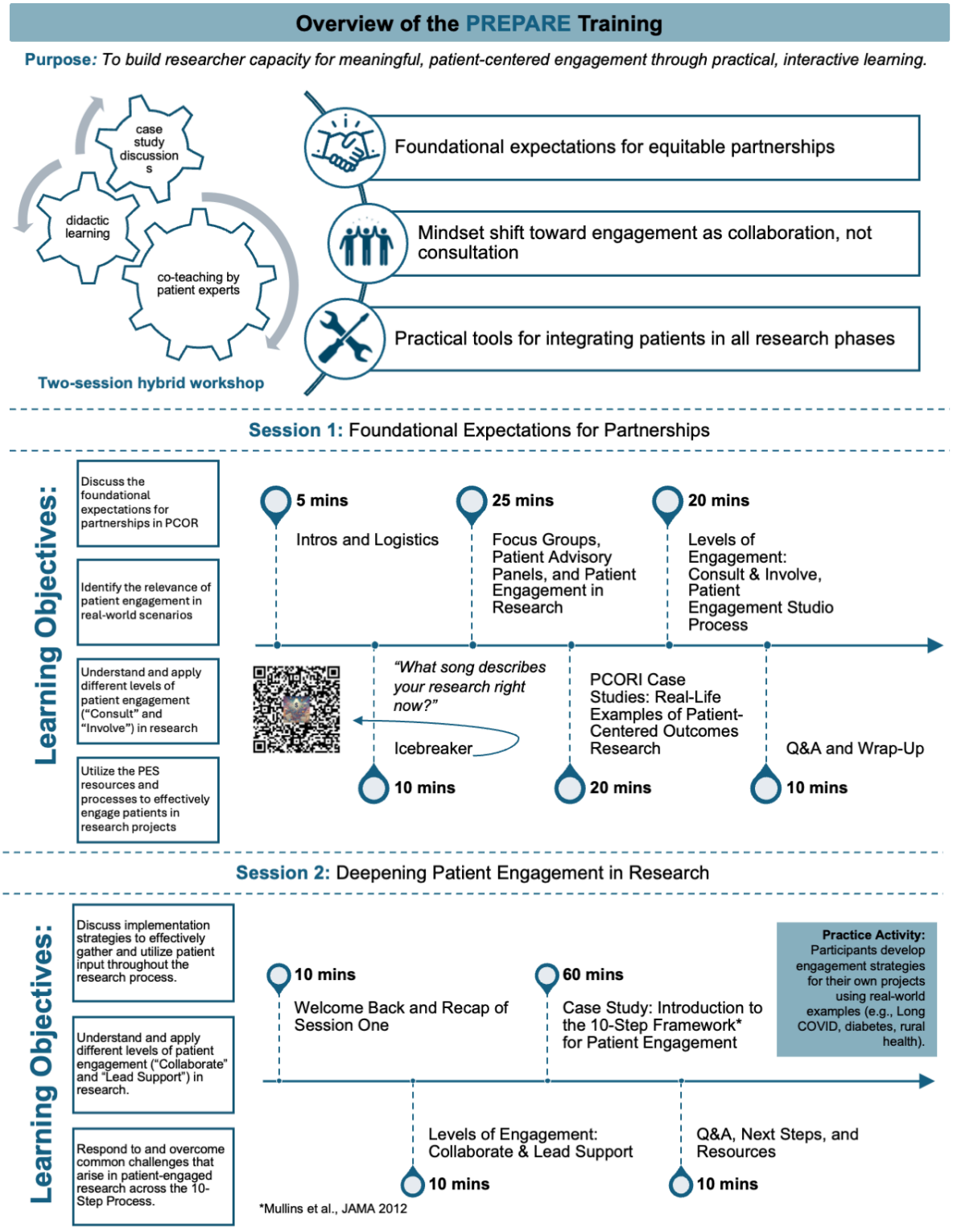


Figure 2

Overview of the PREPARE two-session hybrid training curriculum. The figure shows core instructional components, session-specific learning objectives, and activities designed to build researcher capacity for patient engagement.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- PREPARERIEAdditionalFile1.docx
- PREPARERIEGRIPP2Checklist.pdf