



Orthopedic Providers' Preferences for Education and Training on Psychosocial Clinical Research Initiatives: A Qualitative Investigation

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Abstract

Introduction: Psychosocial factors (e.g., depression, anxiety) increase risk for chronic pain, disability, and other health complications following acute orthopedic traumatic injury. Orthopedic providers lack skills to address these factors. Education around psychosocial factors of recovery and psychosocial clinical and research initiatives could address this gap. The purpose of this study was to understand orthopedic trauma providers' preferences for the design and distribution of educational materials to facilitate psychosocial initiative implementation.

Methods: We conducted live-video, semi-structured focus groups with outpatient orthopedic trauma providers across three Level I Trauma Centers, using a hybrid inductive-deductive approach to analyze qualitative data and extract themes and subthemes characterizing providers' recommendations for appropriate psychosocial education.

Results: Four themes described providers' recommendations for receiving educational materials: (1) provide foundational knowledge and tools about psychosocial factors; (2) provide information regarding a psychosocial initiative's purpose and procedures; (3) leverage educational materials to maximize buy-in to psychosocial clinical research initiatives; and (4) deliver information concisely, clearly, and electronically.

Conclusion: Orthopedic providers recommended ways to optimize design and dissemination of education on psychosocial care. Optimizing knowledge of psychosocial factors and clinical and research initiatives facilitates providers' ability to appropriately target the often-underdressed psychosocial component of recovery in orthopedics.

Keywords

orthopedic trauma, recovery, psychosocial factors, psychosocial care, psychosocial initiative

Introduction

Acute orthopedic injuries are common, costly, and often associated with chronic pain and disability, even after a successful physical recovery (1–4). Psychosocial factors (e.g., anxiety, depression, pain catastrophizing, pain anxiety) play a significant role in recovery from injury (5), surgical procedures (6), and chronic pain disorders (7,8), predisposing those with musculoskeletal injuries to chronic pain and disability, regardless of injury location, severity, or type (9–11). The biopsychosocial model (i.e., the theoretical model emphasizing the interplay of biological, psychological, and social factors that impact health (12,13)) supports the implementation of integrated care models to help target the often under-addressed psychosocial component of physical illnesses and injuries.

Orthopedic medical providers are in an important position to advance the integration of psychosocial clinical and research initiatives (i.e., psychological interventions, services, and resources) for those recovering from orthopedic injury. Implementation of psychosocial initiatives for patients with

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musculoskeletal pain has been recommended to enhance secondary prevention of disability by preventing chronic pain and promoting resiliency, thus reducing the impact of orthopedic injury and optimizing patient outcomes (14–16). Further, existing evidence-based psychosocial interventions have demonstrated efficacy in addressing psychosocial aspects of recovery (17,18). These interventions aim to teach adaptive coping, which includes strategies to function despite pain, and is associated with lower disability (19). Findings indicate that orthopedic patients can learn active coping strategies through psychosocial interventions like resiliency training, and patients find these interventions highly acceptable (20).

Despite evidence for the recovery-related benefits of psychosocial initiatives, most orthopedic surgical practices have not incorporated psychosocial care. An important barrier to implementing psychosocial initiatives in the orthopedic trauma setting—and thus advancing the biopsychosocial model—is surgeons' lack of knowledge and confidence regarding addressing psychosocial factors of recovery. Orthopedic providers may often notice but feel uncomfortable discussing psychosocial issues with patients and referring them for psychological treatment (21). Orthopedic providers' lack of knowledge about the importance of psychosocial factors in patient care has also been noted by providers themselves (22). Typically, within orthopedic practices, referrals for psychological services are made when patients have already developed chronic pain and disability, after the critical period for preventative intervention has already passed (21,23). Implementation of psychosocial interventions during this critical period could teach patients skills to increase their resiliency and promote recovery.

Brief educational interventions, such as those focused on improving provider confidence in managing psychosocial sequelae of orthopedic trauma, have been shown to be effective in improving orthopedic provider confidence addressing psychosocial factors related to patients' recovery (23). Thus, one important way to address this barrier to psychosocial initiative implementation may be developing and providing educational materials for orthopedic providers aimed at increasing knowledge around psychosocial factors of recovery in general and psychosocial clinical and research initiatives. Broadly, optimizing educational materials for orthopedic providers could promote more holistic understandings of recovery and support integration of psychosocial care into orthopedics.

To our knowledge, no studies have explored orthopedic providers' preferences for education aimed at enhancing knowledge and confidence to successfully address patients' psychosocial concerns. Understanding these preferences would allow for maximally informed design and distribution of educational materials and higher rates of their enthusiastic adoption by providers. We conducted a multi-site qualitative investigation to understand orthopedic providers' preferences for educational materials concerning (1) psychosocial factors relevant to recovery from orthopedic injury, and (2) psychosocial clinical and research initiatives.

Methods

Participants and Procedures

We conducted semi-structured focus groups over live video (i.e., Zoom) with providers at three Level 1 Trauma Centers (Sites A, B, and C, anonymized), located in Austin, Texas; Lexington, Kentucky; and Boston, Massachusetts. Focus groups were facilitated by both male and female predoctoral and postdoctoral research fellows in psychology with training by the multidisciplinary team and no prior relationship with participants (AMV, JB, JD). Participants included diverse medical and health care professionals involved in the outpatient care of acute orthopedic trauma patients, including attending surgeons, residents, nurse practitioners, medical assistants, social workers, and clinical research fellows. Researchers had no prior relationships with the participants. Participants were recruited at each site by an orthopedic surgeon who “championed” and presented details on our study to other providers. Potential participants were informed of the study aim being to understand their perceptions of barriers and facilitators to implementing a psychosocial initiative within their clinic and were aware that facilitators were members of a clinical research team focused on the development and implementation of mind-body interventions. We sent interested providers a survey through Research Electronic Data Capture (REDCap (24)) to screen for eligibility to participate in the focus groups. Providers were eligible if they were directly involved in the care of outpatients with acute musculoskeletal injuries (e.g., fracture, dislocation, rupture) at any of the three participating Level 1 Trauma Centers. The Institutional Review Board of Site C approved all study procedures.

Out of the 94 providers who were sent the REDCap survey, 88 completed the survey and therefore provided implied consent to participate in focus groups. Nine were unable to participate in focus groups for scheduling reasons after consenting; therefore, 79 took part in qualitative data collection. We conducted a total of 18 60-min focus groups, with a range of four to eight participants in each group (organized by role of providers). Department chiefs ($n = 3$) participated in 30-min individual interviews instead of participating in focus groups. A total of 17 attending surgeons, 28 residents, 10 nurse practitioners/registered nurses/physician assistants, 13 medical assistants, 5 physical therapists/social workers, and 3 clinical fellows participated in the focus groups. Following each focus group, participants had the option to participate in a brief, 10-min individual exit interview through the “breakout room” feature on Zoom. Demographic data for participants are displayed in Table 1.

Procedure

We iteratively developed our semi-structured qualitative script with a multidisciplinary team including psychologists, orthopedic surgeons, and an implementation science expert (Table 2). The script aimed to generate feedback on utilizing

Table 1. Participant Descriptive Statistics (N = 79).

	Surgeons/Residents (N = 48)	Other Health Care Professionals (N = 31)
Sex		
Male	44 (91.7%)	10 (32.3%)
Female	3 (6.3%)	21 (67.7%)
Other	1 (2.1%)	0 (0%)
Age		
25-39	32 (66.7%)	20 (64.5%)
40-55	13 (27.1%)	10 (32.3%)
56-65	2 (4.2%)	1 (3.2%)
66-75	1 (2.1%)	0 (0%)
Race		
White/Caucasian	35 (72.9%)	22 (71.0%)
Black/African American	4 (8.3%)	3 (9.7%)
Asian/Asian American	6 (12.5%)	0 (0%)
Multi/Other	3 (6.3%)	6 (19.4%)
Ethnicity		
Hispanic/Latino	1 (2.1%)	12 (38.7%)
Non-Hispanic/Latino	47 (97.9%)	19 (61.3%)
Marital Status		
Single (never married)	15 (19.0%)	12 (15.2%)
Married	31 (39.2%)	15 (19.0%)
In a domestic partnership	1 (1.3%)	0 (0%)
Divorced	1 (1.3%)	4 (5.1%)
Household Income		
20,001–50,000	0 (0%)	9 (11.4%)
50,001–100,000	21 (26.6%)	7 (8.9%)
100,001–200,000	8 (10.1%)	12 (15.2%)
200,001–300,000	2 (2.5%)	2 (2.5%)
300,001–400,000	0 (0%)	0 (0%)
400,001–500,000	2 (2.5%)	0 (0%)
500,001–750,000	12 (15.2%)	1 (1.3%)
<750,000	3 (3.8%)	0 (0%)
Self-Reported Mental Health Training		
Yes	24 (50%)	16 (51.6%)
No	24 (50%)	15 (48.4%)

psychosocial clinical and research initiatives within orthopedic trauma settings. We specifically aimed to understand providers' preferences regarding the design and distribution of information and knowledge about psychosocial aspects of recovery and psychosocial initiatives. All interviews were audio recorded, transcribed, and de-identified.

Data Analysis

Our analytic approach consisted of a hybrid inductive and deductive qualitative coding techniques. Our inductive approach involved using the CFIR and Proctor implementation research frameworks to determine our coding framework (i.e., codebook). These implementation research frameworks provide evidence-based sets of determinants for effective implementation to consider in any implementation-related research question (25,26). They are composed of different domains, which categorize these determinants and provide a pragmatic structure for approaching implementation processes that are complex, interacting, and multi-level in nature. Three team members independently applied the coding framework

to the transcripts in NVivo 12 software (27). Coders met to discuss discrepancies in coding to reach consensus.

Following coding of the data, the deductive portion of the analysis involved focusing on one CFIR domain of interest (i.e., the data organized under one code), and collaboratively identifying themes and subthemes related to the research question. Three team members independently extracted data from the "Access to Information and Knowledge" determinant of the CFIR framework that yielded insights related to understanding the psychosocial education needs of orthopedic providers. This determinant is concerned with ease of access to digestible information and knowledge about an initiative of interest, and how to incorporate the initiative into work tasks. The CFIR framework emphasizes this domain as a key indicator of individuals' readiness for implementation (25). We utilized a collaborative, flexible, and iterative approach to interpreting the data coded within Access to Information and Knowledge, identifying themes and subthemes to describe providers' recommendations regarding educational materials related to psychosocial care.

Table 2. Semi Structured Focus Group Script with Domains and Questions.

Clinical flow and openness to innovation	How might patients be smoothly enrolled in a research study without much disruption to clinical flow?
Past experiences implementing clinical innovations	What are your reactions to implementing initiatives as part of clinical care in the orthopedic department? Can you recall any clinical innovations that were implemented in the department that were successful or unsuccessful? What were some of the challenges or benefits about implementing this innovation for you?
Perceptions of psychosocial care within orthopedics	What comes to mind when you think of the terms “psychological issues” or “mental health concerns” or “behavioral health problems”? What do you think about the role of these factors in the recovery trajectory of your patients? Do you ever refer or initiate the connection of patients to psychological services? What would be an ideal scenario for addressing psychological factors for your patients?
Barriers and facilitators to psychosocial care implementation/integration within orthopedic departments	Can you think of any ways to facilitate the implementation of psychosocial care into orthopedic departments? Can you think of any ways to motivate/incentivize surgeons or other medical providers in the orthopedic clinic to make referrals for psychosocial care for their patients?
Education materials to facilitate referrals to psychosocial initiatives	Are there any messages that would be helpful for us to clearly communicate with respect to the importance of psychosocial support for orthopedic patients? What format would be the most effective for communicating these messages? What is the best way to explain study procedures of a psychosocial initiative to health professionals in your department? What is the best way to motivate professionals in your department to refer patients to a psychosocial initiative or study?

Results

Four overarching themes emerged from the qualitative data (see Table 3). Themes 1 and 4 describes orthopedic providers’ recommendations related to educational materials concerning psychosocial factors relevant to recovery, generally. Themes 2 and 3 describe their recommendations around materials concerning utilization of specific psychosocial clinical and research initiatives of interest...Below, we describe each theme, its respective sub-themes, and how they may inform specific methods, qualities, and content for education materials for orthopedic providers.

Theme 1: Provide Foundational Knowledge of Psychosocial Factors and Tools for Patient-Provider Discussion About These Factors

Theme 1 concerns building foundational comfort around the idea of psychosocial factors influencing orthopedic recovery. This can be achieved by addressing gaps in knowledge about the importance of psychosocial factors in orthopedics, and about how to proactively facilitate conversations about psychosocial factors. This theme was determined based on a providers’ recognition of a diversity of opinions and perceptions about psychosocial factors of recovery within the orthopedic field. Theme 1 thus concerns establishing among providers (1) common appreciation for psychosocial factors of recovery, and (2) uniform ability to impress this upon their patients.

Varying opinions about mental health were evident from the interviews. As one medical assistant shared,, “For me, it’s hard sometimes to be as sympathetic for people when they don’t want to get better because it’s—they’re choosing to not get better,” demonstrating how some providers might have negative attitudes toward psychosocial aspects. Providers suggested that addressing the systemic lack of knowledge regarding psychosocial factors could positively influence attitudes and beliefs about psychosocial aspects of patients’ recoveries. This, in turn, could facilitate providers’ openness to integrating psychosocial care. As one medical assistant commented, “The mental health component related to orthopedic trauma and so forth is very important, but there are...people who place more emphasis on that than others... so buy-in is going to be completely individually-based...Perhaps that starts with education and raising awareness to physicians about how important this is,” thus emphasizing the potential effect of education on providers’ attitudes toward psychosocial care. One resident shared “As much as we all like to think that we’re good at recognizing these issues and dealing with them in the clinic setting, I think a uniform training process for the staff willing to participate in this would probably go a long way in streamlining this and making things more efficient,” capturing the value in systematically presenting education across all roles (e.g., medical assistants, residents, surgeons) and the importance of establishing a common understanding of psychosocial factors of recovery in the clinic. Providers mentioned that

Table 3. Orthopedic Providers' Recommendations for Training and Educational Materials Regarding Psychosocial Factors of Recovery and Psychosocial Initiatives.

Themes/Subthemes	Illustrative Quotes
<p>1. Provide foundational knowledge and tools for discussions about psychosocial factors with patients:</p> <ul style="list-style-type: none"> - Educate providers on the basic psychosocial aspects of recovery from orthopedic injury - Familiarize providers with the evidence base for the relevance of psychosocial factors to recovery from orthopedic injury - Supply tools (i.e., specific appropriate language) for discussing psychosocial aspects of patients' recovery to increase provider comfort and confidence and reduce possibility of displaying judgement or stigmatizing patients 	<p>“As much as we all like to think that we're good at recognizing these issues and dealing with them in the clinic setting, I think a uniform training process for the staff willing to participate in this would probably go a long way in streamlining this and making things more efficient.” (Resident)</p> <p>“Giving them some kind of talking points or methods of how to address mental health issues to [REDACTED]'s point, because people will come at it from different, you know, levels of comfort talking about it.” (Resident)</p> <p>“For me, it's hard sometimes to be as sympathetic for people when they don't want to get better because it's—they're choosing to not get better.” (Medical Assistant)</p> <p>“I would just need to have the right education on how to properly work stuff to people to not make them feel like I would think less of them or think that they can't get better.” (Medical Assistant)</p> <p>“I think, for me, I would just need to [...] learn how to speak to patients about that, just because everything I know is ortho... I want to make sure I have the right words.” (Medical Assistant)</p> <p>“The mental health component related to orthopedic trauma and so forth is very important, but there are...people who place more emphasis on that than others... so buy-in is going to be completely individually-based...Perhaps that starts with education and raising awareness to physicians about how important this is.” (Medical Assistant)</p>
<p>2. Provide information regarding psychosocial initiative's purpose and procedures:</p> <ul style="list-style-type: none"> -Provide an easily accessible summary of the initiative to ensure providers are informed and can answer patients' questions (e.g., about content, purpose, procedure of the initiative) -Have a clear, streamlined procedure for referring patients to an initiative and assigning initiative-related roles to each provider -Provide tools to providers to enact their roles and responsibilities (e.g., a script for what to say when approaching/referring patients) -Allow orthopedic providers to review educational materials about the initiative to be distributed to patients 	<p>“I think part of the questions we'll need to address is—and these are just systematic things about how we get patients enrolled—who are the patients we're going to enroll, enrollment criteria, all those little things that we don't want to, you know, have blunders on.” (Chief of Surgery)</p> <p>“You have to have, like, clear cut inclusion criteria. So...it should be as easy as, like, an index card to remind guys that are seeing one hundred people a week.” (Surgeon)</p> <p>“Let people know 'this is what we're doing, this is why we're doing it, this is how it actually is executed and works, and in the end, this is what we hope to provide patients, this is how they're going to benefit from it.'” (Chief of Surgery)</p> <p>“Explain to them how they would benefit from this [...] having a script that would explain to them how they would benefit from this research...” (Surgeon)</p> <p>“I think, just, anything where...someone that we know is personally explaining the benefits and why they [...] care about this.” (Medical Assistant)</p>
<p>3. Leverage educational materials to maximize provider buy-in to psychosocial initiatives:</p> <ul style="list-style-type: none"> -Highlight benefits of psychosocial initiatives to providers -Present preliminary data which support purpose and potential benefits of the psychosocial initiative of interest (i.e., use a data-driven approach) -Address negative or inaccurate beliefs and attitudes providers may have toward psychosocial factors and/or psychosocial initiatives using data - Prioritize educating formal and opinion leaders on the initiative to motivate other providers to engage 	<p>“If you're trying to buy other doctors into it, if they were to get a glimpse of what the actual process is, then they might better understand what is going to happen, what the patients are going to see, what they're going to effect, and get a better feel for whether this is good or bad or whether it's beneficial or not[...].” (Medical Assistant)</p> <p>“We're a pretty data driven population, so [...] exposure to prior research is always going to go a long way.” (Resident)</p> <p>“Medicine is very evidence-based, and—especially surgeons are.” (Resident)</p> <p>“Basically, an honest, straightforward thing about 'We're trying to maximize your outcome and we know that there is some connection that exists, and we need your help, and hopefully you should feel incentivized to be a part of this, so that your outcome can be maximized as well [...] Help us to help you and your outcome by</p>

(continued)

Table 3. (continued).

Themes/Subthemes	Illustrative Quotes
4. Deliver information concisely, clearly, and electronically:	doing this.” (Resident)
<ul style="list-style-type: none"> - Ensure all educational materials are straightforward and easily digestible - Ensure educational materials are as brief and concise as possible - Provide educational materials in virtual format (e.g., PowerPoint, video) or interactive format (e.g., Zoom meeting, in-person communication) when possible - Avoid paper communications and email communications, which are less preferred - Utilize technology, such as mobile applications, to deliver information to providers given that providers are often using phones and computers 	<p>“...and I think if you can provide any kind of preliminary data that you have from your experience at MGH in terms of either patient outcomes or even workload or patient calls or no-show rates or, like, truly anything to demonstrate that this is a—that there is a direct return on investment...” (Resident)</p> <p>“Maybe just a brief educational snippet or a PowerPoint or something that we can bring to the frontline people that are going to be helping us, reminding us that, ‘Hey, this is a great patient, you know[...] remember this study, the enrollment. This is how it goes down.’” (Chief of Surgery)</p> <p>“I definitely agree with nothing paper-related, because most the time, they just throw it away, or they don’t even look at it...I do think something electronically-related would probably be better, because they are pretty much staring at their phones all day, or they’re staring at a computer.” (Research Personnel)</p> <p>“I think a pamphlet, or a brief review [...] because I feel like patients are going to ask, like, ‘how long is this going to take,’ ‘how often do I need to call-in,’ and then at the end [...] a brief thing about...how it’s possibly affected people in the past, or what are the potential outcomes and what might be changing with it.” (Resident)</p>

educational content should specifically feature instructions and tips for communication about psychosocial needs with patients (e.g., scripts, language coaching/colloquial guidance, role play material), as this helps in building conversational comfort with unfamiliar topics. One resident explained the importance of including this type of guidance, as providers would vary in conversational confidence levels: “Giving them some kind of talking points or methods of how to address mental health issues to [REDACTED]’s point, because people will come at it from different, you know, levels of comfort talking about it.” Generally, providers also generally emphasized their resonance with operating within a data-driven field, thus reinforcing the significance of using empirical evidence to supplement education about the relevance of psychosocial factors to orthopedic recovery. Provider endorsement of evidence-based research is explored more completely in regard to Theme 3.

Theme 2: Provide Information Regarding a Psychosocial Initiative’s Purpose and Procedures

Theme 2 concerns education of providers about the specific context, purpose, benefits, and goals of a psychosocial initiative of interest. This theme is based on providers’ expression that having personal familiarity with these aspects of a particular psychosocial initiative fosters buy-in and a willingness to help make referrals to that initiative. One resident commented, “Let people know ‘this is what we’re doing, this is why we’re doing it, this is how it actually is executed and works, and in the end, this is what we hope to provide patients, this is how they’re going to benefit from it.’” capturing the value of conversation around the larger procedures

and purpose of an initiative. One site’s chief of surgery explicated how including information on an initiative’s specific operational aspects would be valuable, saying, “I think part of the questions we’ll need to address is—and these are just systematic things about how we get patients enrolled—who are the patients we’re going to enroll, enrollment criteria, all those little things that we don’t want to, you know, have blunders on.” Distributing procedural education can also promote comfort with introducing an initiative to patients and reinforce providers’ understanding of their individual roles. Providers also mentioned how having easily accessible, user-friendly tools associated with a psychosocial initiative of interest is helpful to simplify and streamline providers’ specific tasks, assist in efficient recruitment for psychosocial clinical research, and minimize burden and disruptions in workflow. One resident suggested “a script [for providers] that would explain to [patients] how they would benefit from this research” as one potentially helpful tool; another suggested “an index card to remind guys that are seeing one hundred people a week [about inclusion criteria]” as another such aid. Providers also suggested that being familiar with any educational information that is distributed to their patients would ensure coherent understandings of the initiative between patient and provider.

Theme 3: Leverage Educational Materials to Maximize Provider Buy-in to Psychosocial Initiatives

Theme 3 is similar to Theme 1 in that it focuses on building knowledge about psychosocial factors of recovery. However, theme 3 concerns establishing knowledge that is not general

and foundational, but rather is more specific to a particular psychosocial initiative of interest, as different psychosocial initiatives might draw on different evidence-based coping strategies to facilitate recovery. This theme was determined based on providers' endorsement of concrete, empirical data supporting potential benefits that any psychosocial initiative will provide to their patients. Theme 3 thus captures how to establish provider confidence that a particular psychosocial initiative will improve their patients' recovery and functional outcomes. One medical assistant's comment captures how emphasizing evidence is important in the context of orthopedics: "We're a pretty data driven population, so [...] exposure to prior research is always going to go a long way." Another quote from a medical assistant demonstrates how focusing education on patient benefits could help cultivate buy-in: "I think if you just...show [the doctors] the data on how to help their patients heal faster, and how it helps on the recovery process, they'll be all for it." Providers also asserted that directly addressing false beliefs about psychosocial aspects of recovery (i.e., assumptions, impressions, perceptions about psychosocial needs that are not accurate or consistent with data)—as discussed in regard to theme 1—would also help establish understanding of the background for psychosocial initiatives and overcome false-assumption-based barriers for building support for psychosocial initiatives in general. Thus, adopting a data-driven approach could address any pre-existing biases that may otherwise hinder willingness to refer patients to a psychosocial initiative. Of note, some providers mentioned the potential benefit of engaging influential members of staff (e.g., department leadership) to help incite a "downstream effect" in which other members of staff are subsequently encouraged to support and utilize psychosocial initiatives.

Theme 4: Deliver Information Concisely, Clearly, and Electronically

Theme 4 concerns effective ways of distributing educational materials. It addresses questions about which formats/features are most appreciated by providers. This theme was determined based on providers' common description of time and energy being significant barriers to willingness to implement any innovation in the clinical setting. Theme 4 thus captures how to address this barrier and maximize provider willingness to engage with educational materials. To maximize provider willingness to engage with educational materials, packaging and distribution of information must be convenient and succinct. A member of the research personnel at one site commented on time being a major barrier to educational material engagement, saying "I think a pamphlet, or a brief review [...] because I feel like patients are going to ask, like, 'how long is this going to take,' 'how often do I need to call-in.'" As captured by a Chief of Surgery's comment, educational materials should be packaged such that they are easily distributed to maximize

provider willingness to engage with educational materials: "Maybe just a brief educational snippet or a PowerPoint or something that we can bring to the frontline people that are going to be helping us, reminding us that, 'Hey, this is a great patient, you know[...]remember this study, the enrollment. This is how it goes down.'" Providers expressed a preference for materials that can be accessed and understood with as little difficulty as possible. A member of the research staff at one site described an app which demonstrates many useful, desired features of educational materials: "It's an app, and I guess that would give you like a feel for like the brevity of it, and the organization... basically, just minimize...the number of steps." Providers emphasized the value in clarity and brevity in the context of their heavy daily workloads to minimize time and effort in implementing an initiative.

Providers expressed that they value interactive methods of receiving education, citing the engaging nature of face-to-face communication and training as advantageous over less personal methods, like emails or pamphlets. Thus, for information delivery, participants preferred online or in-person formats. For information distribution, providers expressed their preference for virtual forms of distribution of resources. As one research personnel member commented, "I definitely agree with nothing paper-related, because most the time, they just throw it away, or they don't even look at it...I do think something electronically-related would probably be better, because they are pretty much staring at their phones all day, or they're staring at a computer," thus capturing how virtual formats might be more consolidated and convenient to access, finding paper communications might be more disorganized and easily forgotten or misplaced.

Discussion

We conducted a multi-site qualitative study to understand the preferences of diverse orthopedic medical providers for the development and distribution of educational materials related to psychosocial care. We identified themes that represent best practices for effectively educating providers about the psychosocial factors of recovery and about utilizing psychosocial clinical and research initiatives in the orthopedic trauma setting. Our findings offer guidelines for future researchers and multidisciplinary clinicians aiming to integrate novel psychosocial initiatives in orthopedic settings, revealing several key insights that inform the development and implementation of educational materials for providers.

We found that educational materials for orthopedic providers should aim to establish a baseline understanding of orthopedic patients' psychosocial needs and how psychosocial factors relate to recovery from orthopedic injury. Of note, providers mentioned a desire for direct guidance in discussing psychosocial needs with patients to facilitate more confident conversations about these needs. This finding is in line with implementation science literature, self-efficacy is one of the most common individual measures in theories of individual change (28). The CFIR implementation

framework domain of access to information and knowledge accounts for the findings that increasing provider self-efficacy is important for increasing the likelihood of providers embracing psychosocial initiatives of interest and exhibiting committed use, even in the face of obstacles (25).

Further, education should aim to foster support for specific psychosocial initiatives of interest by focusing on their purpose, procedures, and potential benefits, and using data-driven approaches (i.e., literature supporting psychosocial initiative's ability to improve outcomes). This is consistent with literature conceptualizing and evaluating successful implementation based on outcomes, which has confirmed the importance of stakeholder perception that a given initiative's background, content, and nature is acceptable when implementing it. According to this research, this acceptability should be assessed based on the stakeholder's knowledge of or direct experience with various dimensions of the initiative to be implemented, including its content and context (26). Lack of this perception of acceptability has long been noted as a challenge in implementation (29). Thus, cultivating familiarity with a psychosocial initiative's context and goals ensures that providers feel knowledgeable, confident, and comfortable with referring patients.

Educational materials should also aim to maximize provider buy-in by targeting misconceptions and creating a "downstream" effect by establishing support from leaders whose opinions are influential among clinic staff. Additionally, empirical, purpose- and potential benefit-focused discussion reinforcing perception of common goals between providers and researchers should be facilitated. This is in line with literature suggesting that buy-in can be fostered from multiple angles, including emphasizing the value of a psychosocial initiative, and focusing on shaping the opinions of influential members of an organization (25).

Finally, education should be distributed concisely and electronically and aim to minimize burden on providers. Participants preferred online formats for information delivery. They preferred online formats over paper formats for information distribution, which are generally at least as effective as traditional learning approaches for health care professionals (30). Additionally, busy workflows limit providers' available time to dedicate to learning about an initiative. This supports prior research that has assessed provider learning needs in other medical contexts, such as cancer care (31) and pediatrics (32), and has identified time constraints as the biggest barrier to providers accessing learning opportunities. Within the field of orthopedics, orthopedic trauma providers have noted lack of time as a primary barrier to integrating psychosocial care into their clinical practices. Thus, the value in maximizing efficiency and ease of access to educational materials should not be overlooked.

Conclusion

The large number of participants involved in the focus group and diversity of roles were primary strengths of this study. A

total of 79 providers across three geographically diverse sites (Austin, Texas; Lexington, Kentucky; and Boston, Massachusetts) and spanning a variety of roles (e.g., medical assistants, research personnel, surgeons, and residents) participated, allowing for multiformity in perspectives, preferences, and experiences in qualitative data collection. Additionally, our separation of interviews by roles helped secure participants' comfort in sharing thoughts on their orthopedic clinic and its culture around psychosocial needs. A limitation was lack of racial and gender diversity of participants. 27.8% of participants were non-Caucasian, and 30.4% of participants were female, limiting the transferability of our findings. Additionally, findings were not separated by role or site, so ideas and themes described do not capture differences in perspectives by role. The professional scope of practice of each practitioner would necessarily entail different roles and responsibilities related to psychosocial interventions. Thus, further research might attempt to delineate how knowledge gaps and preferences for learning might vary across the range of roles among healthcare practitioners. Further research could also define ways to identify specific knowledge gaps of the audience and adjust the design educational materials based on these educational needs. This would ensure site-by-site maximization of implementation feasibility.

In the context of the increasing relevancy of integrated care models, improving integration of psychosocial initiatives in medical settings is important. This is especially true within orthopedics, since psychosocial factors are known to contribute to recovery from acute orthopedic injuries (9–11). Strategies for educating providers about psychosocial aspects of recovery and psychosocial initiatives can increase provider buy-in and self-efficacy, thus improving referral processes to psychosocial care and facilitating recovery of orthopedic patients by promoting productive pain management, and targeting the disability spiral, catastrophic thinking about pain, and kinesiophobia (20,33,34). Concentrating on optimizing provider education related to psychosocial care is central to improving orthopedic injury outcomes.

Consent for Publication

The authors have given their consent for this paper to be published.

Informed Consent and Patient Details

"I confirm that all participant/personal identities have been removed or disguised so the participant/person(s) described are not identifiable and cannot be identified through the details of the story."

Declaration of Conflicting Interests

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